DOCUMENT RESUME

ED 040 663 HE 001 558

AUTHOR	Lantz, Robert J.
TITLE	The Negro and Engineering Education: A Selection of Responses from 100 Deans of Engineering.
INSTITUTION	Boston Univ., Mass. Coll. of Engineering
PUB DATE	30 Apr 70
NOTE	99p.
EDRS PRICE	EDRS Price MF-$0.50 HC-$5.05
DESCRIPTORS	*Compensatory Education Programs, *Disadvantaged Youth, Educational Needs, *Engineering Education, Engineers, *Higher Education, *Negro Students, Special Programs, Surveys

ABSTRACT

This report contains the responses and comments of 100 deans of engineering colleges to a questionnaire pertaining to black students and engineering education. The questionnaire was divided in three parts. Part I requested information on the number of (1) freshmen, (2) seniors, and (3) total students in all engineering departments. Part II contained 8 questions to be answered on a five point scale on the significance of engineering education for the black student, the adequacy of the training in black colleges for work in today's bureaucratic corporations, and the responsibility of predominantly white colleges to provide special programs, financial aid and actively recruit black high school students. Part III requested information on the experience of predominantly white schools with special programs for black students, and asked whether schools desired to organize a special program, but failed to because of lack of funds or fear of lowering admission standards. The responses are interpreted and recommendations made. (AF)

PRINTED BY THE STANDARD REGISTER COMPANY, U.S.A.

FORM 0801

ED0 40663

THE NEGRO AND ENGINEERING EDUCATION--A SELECTION OF RESPONSES FROM 100 DEANS OF ENGINEERING

BY

ROBERT J. LANTZ
PROFESSIONAL ENGINEER
ASSISTANT PROFESSOR OF ENGINEERING

The material contained within this report represents responses from 100 deans of engineering colleges, covering almost every state in the nation (and parts of Canada), that have at least one program approved by ECPD, and at least one graduate program in engineering. Their responses come from a questionnaire stimulus given to them that pertained to the black student and engineering education.

The questionnaire stimulus and the editorial comments have been under the auspices and supervision of the Boston University School of Theology and the Boston Industrial Mission--yet the full responsibility for this report and the concealment of all identities of deans and engineering colleges that have participated in this survey, rests solely and completely with its editor, Robert J. Lantz.

ASEE and the JOURNAL OF ENGINEERING EDUCATION serve only as silent observers on this project and have no formal or official connection with this survey. They will consider its results at their own discretion.

The editorial points of view or opinions stated in this document do not necessarily represent the official positions of either the Boston University College of Engineering, the School of Theology or the Boston Industrial Mission.

BOSTON UNIVERSITY COLLEGE OF ENGINEERING
110 Cummington Street
Boston, Massachusetts 02215

April 30, 1970

HE 001 558

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY

QUESTIONNAIRE

PLEASE COMPLETE AND MAIL TO:
ROBERT J. LANTZ, ASSISTANT PROFESSOR OF ENGINEERING,
BOSTON UNIVERSITY COLLEGE OF ENGINEERING,
110 Cummington St., Boston, Mass. 02215

COLLEGE: ____________

____

STATISTICS (1969-70 ACADEMIC YEAR)

	BLACK	WHITE & OTHERS
1. Number of freshman students in all engineering departments..................		
2. Number of senior students in all engineering departments....................		
3. Total number of students in all engineering departments.....................		

PROJECTED IDEALS

1. Do you feel that engineering is a crucial means of upward social mobility for the black people?..

YES ☐ ☐ ☐ ☐ ☐ NO
1 2 3 4 5

2. Do you think that the black student has something special to offer the engineering profession for the eventual combining of technology with humanism?..

YES ☐ ☐ ☐ ☐ ☐ NO
1 2 3 4 5

3. Do you feel that the black colleges can adequately train engineering students for work in our existing bureaucratic corporations?...............

YES ☐ ☐ ☐ ☐ ☐ NO
1 2 3 4 5

4. Do you feel that the existing bureaucratic corporations & the engineering schools can adapt to the needs & aspirations of black student?............

YES ☐ ☐ ☐ ☐ ☐ NO
1 2 3 4 5

5. Do you feel that the predominantly white engineering colleges under the auspices of ASEE should attempt to encourage black high schools to provide adequate curriculum & counseling for the channeling of some black students into their engineering programs?..

YES ☐ ☐ ☐ ☐ ☐ NO
1 2 3 4 5

6. Do you feel that it is the responsibility of predominantly white engineering colleges to provide special programs & financing for the black student for the balancing (racially) of all engineering colleges?..............
(Please add comments)..

YES ☐ ☐ ☐ ☐ ☐ NO
1 2 3 4 5

7. Do you feel that the predominantly white engineering colleges should actively recruit black students from their existing high schools?..........

YES ☐ ☐ ☐ ☐ ☐ NO
1 2 3 4 5

8. Does special programs for blacks mean lowering admission standards?........

☐ ☐ ☐ ☐ ☐
1 2 3 4 5

EXPERIENCE (OF PREDOMINANTLY WHITE SCHOOLS)

1. Have you ever attempted a special program for the black student?...........

YES ☐ ☐ NO

2. If you did, do you regard the result of your efforts a success?............

YES ☐ ☐ ☐ ☐ ☐ NO
1 2 3 4 5

3. Have you wanted to organize a special program for the blacks, but funds were not available?..

YES ☐ ☐ ☐ ☐ ☐ NO
1 2 3 4 5

4. Have you wanted to organize a special program for the blacks but you fear a lowering of your admission standards?..............................

YES ☐ ☐ ☐ ☐ ☐ NO
1 2 3 4 5

THANK YOU

AN INTRODUCTION TO THE OBJECTIVE DATA

There are two types of data and responses represented in this report, 1) subjective data and 2) objective data. The subjective data is "feeling" data as expressed by 100 of the 180 deans to whom this questionnaire was sent. The subjective data is presented in its entirety by the editor exactly as he received their comments back from the questionnaire stimulus. The comments from the deans are their subjective responses to each individual question; they are not pulled out of context but were directed precisely at the question by the deans of engineering.

However, as one reads this report he may find his own "feelings" running rampant either in relation to the question asked, the responses of the deans or in reaction to the subjective editorial comments. This is perfectly natural, for each of us approaches the racial question with preconceived ideas and with an inevitable degree of prejudice that none of us can escape. For fear of this happening with a complete loss of the objective data, this introduction will summarize only the major objective data as received from the study of the black man and engineering education. This objective data was received from two major sources, 1) the results of the questionnaire and 2) the data given on pages 403-405 of the January (1970) edition of Engineering Education journal.

The first set of objective data regards the freshman class for this year (1969-70 academic year). 64 ECPD accredited engineering colleges responded to the questionnaire that have a total of 25,248 freshmen engineering students this year; 11% of these colleges reported no black students among their freshman class. The overall white-to-black ratio for this freshman class is 60.5 white freshmen students to every one black student. 32 of the 64 colleges reported that they have attempted a special program for the black student; this category of colleges has a total freshman class of 15,503 engineering freshmen. None of the 32 colleges reported "no blacks" in their freshman class; the white-to-black ratio for these colleges is 56/1, which is four points lower than for the 64 colleges.

The second set of objective data regards the senior class for this year (1969-70 academic year). The same 64 colleges reported 18,887 engineering students in their senior classes; 30.5% of these colleges reported "no blacks" in their senior class. The overall white-to-black ratio for this senior class is 125 white students to every one black student. Likewise, 32 of the 64 colleges reported that they have attempted a special program for the black student; this category of colleges has a total senior class of 10,371 students. 25.8% of these 32 colleges reported "no blacks" in their senior class, which is 4.7% lower than for the 64 colleges. The white-to-black ratio for these 32 colleges is 142/1.0 which is 17 points higher than for the 64 colleges.

In comparing the first set of objective data with the second, we see that among the 64 colleges the white-to-black ratio increases from 60.5/1 for the freshman class to 125/1 for the senior class. Likewise the percentage of 11% reporting "no blacks" in the freshman class increases to 30.5% reporting "no blacks" in the senior class. The total undergraduate student body for these 64 colleges is 85,575 engineering students.

The third major set of objective data regards the 6 black engineering colleges in our nation and their contribution to the output of black engineering graduates. This information was obtained from the January (1970) edition of Engineering Education journal on pages 403-405.

From the data given, 312 blacks graduated last year with an engineering degree; these 312 students were reported from 109 engineering colleges out of a possible 269 engineering colleges across our nation; all 6 of the black colleges furnished data on their graduating class. With this restriction of data, we can deduce that the black colleges furnished 181 of the 312 graduates, which is 58% of the black graduate output reported. Two of the black colleges are approved by the profession of engineering by ECPD standards; their output of black students last year was 42 engineering graduates, out of 181 total produced by all 6 black colleges. Thus we have that those remaining 4 black engineering colleges not approved by ECPD standards produced last year 139 black engineering graduates out of the total reported of 312 black graduates. Therefore, we conclude that of the 312 black engineering graduates reported last year from 109 engineering colleges, 45.1% of the graduates were from four black colleges not approved by the profession of engineering according to ECPD standards.

The last major set of objective data was obtained from 81 ECPD accredited engineering colleges responding to the questionnaire. 38 colleges (47%) reported that a special program for the black student has been organized on their campus while 53% reported no special involvement with the black student. Among those 38 colleges that have attempted a special program of some kind for the black student, only 3 colleges reported excellent results with their program; 7 colleges reported that their program was too new to evaluate at this time.

The outline of this document takes the same form with each question. The written responses from the deans of engineering are first given as categorized by their subjective position. Their written responses are then followed by the statistical graphs of the participating colleges with their accompanying interpretation by the editor; this interpretation is kept as objective as possible. Lastly follows the editorial comment by the editor which is by no means objective in nature. This comment merely uses the objective and subjective data to support a subjective thesis. In these comments the editor attempts to digest the total responses from the deans of engineering and form a unity. It is a subjective unity but is based upon both subjective and objective data.

The editor is white of a protestant, calvinistic background; he is not black and thus is highly limited in his subjective analysis, for he too has inescapable prejudices. In this respect, his editorial comments may sound more like a case of indigestion than a subjective regeneration, but yet he attempts to maintain empathy with the black man at all points of his analysis. His apologies go to whomever this subjective regeneration may offend, but with all humility, it is a serious effort to understand the problem at hand.

A SUMMARY OF THE SUBJECTIVE EDITORIAL COMMENTS

This report is presented in the spirit that the definition of a problem precedes the solution of that problem. Yet, it does not stop merely at the definition of the problem but attempts to understand the forces underlying the superficial nature of the problem, both as they relate to the engineering colleges and as they relate to the black man in his ghetto habitat. But, there is also a third step that this document takes: a step that attempts to zero in on the problem at hand and the forces underlying the problem. The third step is that of recommending a solution to the situation as illustrated by the first two processes.

The nature of the problem is of no small significance. The predominantly white engineering colleges are graduating 125 white students before the first black man comes through, and all of this is occurring in a free society where there live 8 white men to every black man. However the number problem is only as superficial as the color problem. The real problem lies in the educational filtering process that has very little regard for such factors as respect and dignity of groups within the populace--an educational filtering system that is apathetic in nature toward the needs in that society. Statistics, such as 60% of all engineering colleges last year without one black among their graduates, and attrition rates for blacks in engineering twice that of whites, are only indicative of this apathy. The apathy of the white engineering colleges is causing only further decay of racial gains in our nation. The corporations desire black engineers and are hiring black engineers, but a majority of these engineers are being graduated from black colleges not approved by the profession of engineering and in many respects, of a technician caliber. Decay will be created in the corporations as they associate inferior education with the color of a man's skin. All of this is saying that the manifested problem at stake is that of the black man's respect and dignity--respect and dignity that he has been struggling 350 years to obtain in our nation.

What are some forces underlying the problem at hand? To name a few let's mention the minute motivation and interest of the black student toward engineering. What causes him to by-pass this profession as if it were labelled "poison"? And what about the situation of the black high schools, where the leadership and guidance has traditionally been toward the liberal arts rather than toward the sciences and engineering?

These are forces within the black high school and within the black culture that know no other than that of their past limited tradition. And forces are operating within the engineering colleges that assume freedom of all people, whereby not all people even realize this freedom, forces that assume that merely to provide opportunity is enough, assuming that the best qualified of our society will be creamed-off and given that opportunity. The most fatalistic force of all is the resultant damage to the filtered and rejected minority group of blacks who never reach this opportunity, a minority group who is publicly announcing, "we will have our manhood or the earth will be leveled in our attempt to get it." (Cleaver, Soul on Ice). But also this is a minority group traditionally forced into self-hatred and a sense of inferiority that separates them from full humanity in our nation.

These forces are fairly obvious if we can just remove our blinders of prejudice and feel for the black man as if he were one's self. Here lies the strongest counteracting force of all, the force of empathy over apathy, that can steer our nation away from a racially violent collision course. And the engineering colleges are by no means exempt from their responsibility in adding to this possibility.

The third step taken in this report is that of recommending a solution to the problem at hand. The major problem is that the blacks are not interested in engineering, and the ones that are interested and are pursuing its path are dropping out of the engineering colleges at a rate twice that of their white counterparts.

So the solution attempts to first solve the problem of blacks not being interested in the profession of engineering. It is believed that this disinterest is not of their own free choosing, but rather because of their limited position in society and in the total educational process. The solution offered is that empathy be displayed by the engineering colleges by exchanging one or two of their faculty members for the same number of black high school instructors, an action that will strike at the motivation, interest and education of the black student opening a channel toward the profession of engineering. It will also strike at the problem of inadequate black representation on the engineering faculty. This action will provide life line "education tubes" extending from the first-class engineering colleges into the heart of the negro population, the black ghetto.

However, what about the other side of the problem--the problem of a high drop-out rate of black students within engineering education itself? It is believed that the root of this drop-out is a lack of black empowerment in the engineering colleges. And here I do not mean radical separatist black power, but black empowerment that requires economic, political and participation supports. The mere action of having black representation on the engineering faculty adds to this type of empowerment, but empowerment is also needed among the students themselves. This can only come when a relatively large group of blacks are allowed within the walls of engineering education; they as a group will sustain themselves and will develop autonomy to successfully pass through the engineering education process. So in essence, this report is not calling for the raw assimilation of blacks into the existing system, but is calling for absorption as blacks and allowing them freedom to develop their own autonomy and destiny. This report does not call for white paternalism but calls for autonomy and freedom for the black man.

The last recommendation made in this report is the need for uniting the engineering colleges under a mediator or centralized agency to deal only with black engineering education--a centralized agency that can control the "feeder tubes" extending to the black high schools, and an agency that can recommend adequate black programs on the engineering campus. Presently, many of the colleges are reporting only mediocre results in dealing with black education, and the statistical results of this report do not even come up to par with mediocrity. It is believed that a greater degree of success could be attained if the colleges could be united under the auspices of a nationwide mediator and centralized agency, which could be knowledgeable in the problem at hand and which could offer responsible changes where changes are needed.

As a postscript, let me state again that the recommendations and conclusions of this report are intended to fit closely the data given by the engineering schools, both from this questionnaire and in the engineering graduate data given in the January 1970 edition of the Engineering Education journal. This report does not speculate how the white-black ratio would change if all 269 engineering colleges furnished data instead of the 80 or 100 that did, nor does it speculate how the data would change if more deans had given their comments to the questions. The report merely attempts to subjectively tie the given data together and form a coherent and complete unity.

TABLE OF CONTENTS
(CLASSIFICATION OF DEANS' REPLIES)

PAGE

I GENERAL COMMENTS.. 10

A. Positive
B. Negative
C. Graphs & Interpretations
D. Editorial Comments

II QUESTION NO. 1--IS ENGINEERING A CRUCIAL MEANS OF UPWARD SOCIAL MOBILITY FOR THE BLACK PEOPLE?.......................... 23

A. Appropriate But Not Crucial
B. Graphs & Interpretation
C. Editorial Comments

III QUESTION NO. 2--DOES THE BLACK STUDENT HAVE SOMETHING SPECIAL TO OFFER THE ENGINEERING PROFESSION FOR THE EVENTUAL COMBINING OF TECHNOLOGY WITH HUMANISM?............ 27

A. Possibly, But Not More Than Any Ethnic Group
B. Graphs & Interpretation
C. Editorial Comments

IV QUESTION NO. 3--CAN THE BLACK COLLEGES ADEQUATELY TRAIN ENGINEERING STUDENTS?............. 31

A. Some Can
B. Restricted
C. Hidden Implication
D. Graphs & Interpretation
E. Editorial Comments

V. QUESTION NO. 4--CAN THE CORPORATIONS AND ENGINEERING COLLEGES ADAPT TO THE NEEDS AND ASPIRATIONS OF THE BLACK STUDENT?........ 40

A. One Way
B. Two Ways
C. Uncertain About Needs
D. Graphs & Interpretation
E. Editorial Comments

VI QUESTION NO. 5--SHOULD THE ENGINEERING COLLEGES ATTEMPT TO ENCOURAGE BLACK HIGH SCHOOLS?......... 46

A. Favoring the Idea
B. Efforts of Blacks Important
C. All High Schools
D. Graphs & Interpretation
E. Editorial Comments

PAGE

VII QUESTION NO. 6--IS IT THE RESPONSIBILITY OF ENGINEERING COLLEGES TO PROVIDE SPECIAL PROGRAMS AND FINANCING FOR THE BLACK STUDENT?.................... 52

A. Positive Response
B. Primarily Society's Responsibility
C. Finance But No Special Programs
D. Special Programs But Not Finance
E. For All Disadvantaged
F. Questioning The Term "BALANCE"
G. Graphs & Interpretation
H. Editorial Comments

VIII QUESTION NO. 7--SHOULD ENGINEERING COLLEGES ACTIVELY RECRUIT BLACK STUDENTS?................... 62

A. Only If They Are Qualified
B. A Reason For
C. Graphs & Interpretations
D. Editorial Comments

IX QUESTION NO. 8--DO SPECIAL PROGRAMS FOR BLACKS MEAN LOWERING ADMISSION STANDARDS?............. 68

A. Remedial Standards, Yes--Overall Standards, No
B. To Change Criteria For Admission
C. Neither Yes Or No
D. Graphs & Interpretation
E. Editorial Comments

X QUESTION NO. 9--HAVE YOU EVER ATTEMPTED A SPECIAL PROGRAM FOR THE BLACK STUDENT?............ 75

A. Specific Programs
B. Not Feasible
C. Only At The University Level
D. Graphs & Interpretation
E. Editorial Comments

XI QUESTION NO. 10--WAS THE RESULT OF YOUR EFFORTS A SUCCESS?.............................. 84

A. Somewhat Successful
B. Too Soon To Judge
C. Graphs & Interpretation
D. Editorial Comments

PAGE

XII QUESTION NO. 11--HAVE YOU WANTED TO ORGANIZE A SPECIAL PROGRAM FOR THE BLACKS, BUT FUNDS WERE NOT AVAILABLE?............. 90

A. Funds Were Available
B. Miscellaneous Comments
C. Graphs & Interpretation
D. Editorial Comments

XIII QUESTION NO. 12--HAVE YOU WANTED TO ORGANIZE A SPECIAL PROGRAM FOR THE BLACKS, BUT YOU FEAR A LOWERING OF YOUR ADMISSION STANDARDS?... 95

A. No Thought of Lowering Standards
B. Graphs & Interpretation
C. Editorial Comments

I GENERAL COMMENTS (BY DEANS OF ENGINEERING)

A. POSITIVE

"It is my contention that engineering schools have done little or nothing to recruit and attract minority group students into the engineering disciplines. A concerted effort on the part of engineering schools and colleges needs to commence which will focus on the recruitment of minority group students and on the inauguration of special supportive programs for them. Programs that would include personal counseling and academic and remedial tutoring, with heavy emphasis on mathematics, would be of the greatest necessity. Financial assistance available in granting scholarship funds form would need to be identified before any such program of recruitment and supportive services is inaugurated. The only way that such a program aimed at increasing minority group members among the students in the nation's engineering schools can come about is through an extensive commitment on the part of the faculties of these schools or colleges."

"All of the academic wishes to assist the black students in their quest for knowledge and advancement. The question is how to effectively assist them, so that they will become successful citizens and professionals. However, one does notice more and more the emergence of black professionals of high competence, something has been started."

"I think your investigation is worthwhile but some of your questions seem to demean our past intentions and efforts on behalf of the black minority or other minority groups. True, our efforts at enrolling substantial numbers of blacks have not produced significant results but neither have our efforts to enroll Jewish and Protestant students met with the success we would like to point to. I do not like to think that we train white engineers or Catholic engineers but simply engineers, and our programs have been open to all applications with the financial cost being a natural impediment to lower income groups. The University has recently embarked on an intensive program to recruit minority students and offer full financial assistance and compensatory training. The program is new and its results are yet to be evaluated."

"I think we all are aware of the national loss when any individual or group of individuals is denied the opportunity to fully develop their potential. We are struggling along with you to find ways to practically resolve the problems which exist, not so much by condemning what we didn't do before but by working hard to see what we can do now."

"I recognize that our response to this questionnaire may be less than satisfactory, but I found it to be very difficult to answer. I was, therefore, faced with the prospect of either answering in a less than satisfactory way or not answering at all. At the risk of not providing you with complete information I have tried to honestly answer the questions."

"We have treated black and white students alike. Our work-study programs are well represented by blacks. A black girl works in my office. We have never discriminated against black students."

"The black students who graduate in engineering will, in my opinion, have many opportunities to contribute to the developments which will take place during the next 40 years and will be rewarded for their efforts in accordance with their accomplishments. Engineering offers innumerable avenues of opportunity to help in solving a very wide variety of problems. We encourage our graduates to go into business for themselves, to be the innovators and entrepreneurs of their generation. The black student will have good opportunities to do so in the years ahead. So far as I know our graduates, regardless of race, color or creed are eagerly sought by business and industries large and small with beginning salaries for B.S. graduates about $10,000 per annum. We admit black students on exactly the same basis as all other students and we actively seek those with good academic records for our Engineering programs. Some have performed very well in the engineering curricula, while others have not been willing to pay the price in "study and effort" required to obtain the B.S. degree in engineering. In this respect they are no different from our students in general."

"We operate an Upper Division College accepting students at the Junior level. We will admit any junior college graduate that has his AA degree even if considerable remedial work is required. This provides for special work as in question No. 6. No financial. Students from our lower division must complete 96 quarter hours with a C average or better and satisfy the general education requirement to be admitted to the College of Engineering."

"Our normal source of students (UTAH) has very few blacks. Our University has recently supported 6 black students from Chicago (---) to help broaden our contacts with blacks. Our largest minority group is Mexican Americans, of whom the University gets very few. We are trying in a desultory way to get these people into the University, but results have been poor."

"Our engineering students are virtually all from within the State of Idaho which has a population of only 700,000, with a very small percentage of blacks. Our experience must be interpreted against this population background. This is a state-supported institution and it would be virtually impossible to earmark any part of our budget for special "programs" for blacks, American Indians, or any other ethnic minority. We are interested in some of the special programs through various foundations for locally significant minority groups such as the American Indians, but, as stated above, the percentage of blacks among the population from which our students are drawn is not large enough to warrant special programs for the blacks alone. We actively recruit all high school students regardless of race."

"The engineering schools in Canada have a rather different involvement in this problem than those in the U.S. In most areas of Canada, there is not a large minority of blacks, although we do not deny that in certain communities a problem of a depressed black minority does exist. Our involvement is more with those black students coming to Canada from the West Indies and Africa. In respect to these students, we accept any qualified students regardless of racial origin. However, special programs for these people are not economically feasible."

"In all of our replies, we have been referring to the black students who come from ghetto neighborhoods and whose secondary education has been in predominantly black high schools. These comments and observations would not apply to the small number of black students who are admitted through our normal admissions process and who meet our normal admission standards. In other words, in our answers to your questions we have in mind only those black students who are admitted under special circumstances and where the normal admission standards were waived."

"I have not answered your questionnaire because frankly I believe it is not possible for me to fill out the questionnaire and convey a true picture of my judgment of the situation. First of all, let me say that I believe the hottest item on the job market today would be a negro who has a Doctor's degree in almost any branch of engineering. He would be sought after by practically all the large corporations and all of the engineering colleges in the U.S. It should be realized, however, that this person is a very scarce item on the American scene. The primary problem is to interest qualified young people regardless of their ethnic background or the color of their skin in taking undergraduate and graduate work in engineering. Engineering is a complex subject and, in addition to being complex, it requires hard work. A competent engineer differs from a competent scientist in that much of his work is based on judgment and experience. These qualities keep right on augmenting the engineer's value until the time he retires. Due to the social responsibilities of the engineer there can be no compromise with quality. I believe that any person would agree that he would not like to have his appendix removed by an M.D. who had come through a weakened curriculum. By the same token, I believe that most of us would agree that we would not like to drive over a bridge which had been designed by a Civil Engineer who had come through a poor engineering school. There is a public trust aspect in engineering that cannot be escaped, and for this reason, the quality must be the best. This leaves the true problem of how to get more of our young people today to undertake engineering at the college preparatory level. I believe that it would be extremely useful to our country to develop and to widely disseminate preparatory courses in math, physics and chemistry, which would be made available to disadvantaged kids, whatever their background, so that they would be able to enter an engineering college and have a reasonable chance of success. It is apparent, however, that good preparation and high scholastic ability alone will not guarantee success in engineering. The determination factor is a very difficult one to measure. Perhaps one way of getting at it obliquely is through study habits. I have observed over the years that the intelligent young people who have trouble with engineering, for the most part, have study habit problems. I have found quizzes designed to make the young person conscious of his study habits, including strengths and weaknesses, to be a very valuable device. In closing, I should like to inquire more about your own background and life's work.

Please feel free to quote this letter. However, I ask that you quote it in its entirety. I hope to meet you someday and will be glad to discuss any of these ideas with you at length."

B. NEGATIVE

"Tone of questionnaire seems somewhat negative."

"I do not visualize black vs. white engineers or engineering programs. The entire academic achievement problems of minorities (black, brown, poor, whites, etc.) is just more magnified by engineering school demands. I do not see the problem of non-math, no-science high school prep a minority problem."

"Your questionnaire is ridiculous. I see no way it can give you answers that will provide any successful or constructive degree of objectivity. Your questions are misleading and qualitative. They match the old one "Have you stopped beating your wife?"

"It has been my privilege over many years of teaching in the engineering profession to teach a considerable number of black engineering students and to assist them in obtaining employment. I feel I have some knowledge of the problem and should be one who could contribute meaningfully to your attempt to feel the pulse of the engineering education profession. I find this to be completely impossible since you use a number of words and phrases which give very special meaning to your questions and place them somewhat in the type, "Have you stopped beating your wife?" Your use of words and phrases like "crucial means", "something special", "existing bureaucratic corporations", and others makes it impossible to answer this questionnaire with any degree of accuracy and in my opinion any publication of results would be subject to extreme question."

"Engineering students are, contrary to popular belief, human. Be they white, black, grey, brown, red, green, purple, striped, polka-dotted, Whig or Tory, does not alter the fact that they are human, and that they are engineering students. In black and white or white and black, Newton's law is still valid. Your very colorful questionnaire is regretfully returned."

"Sorry, but I feel disinclined to respond. Some information you request would be very hard to get and the opinions requested do not appear to be altogether meaningful."

C. GRAPHS & INTERPRETATION (FIGURES 1, 2, & 3)

1. The top graph (Figure 1) is a random sample of the freshman class for this year (1969-70), from 64 ECPD accredited engineering colleges. The next figure down (Figure 2) separates from this group, 32 colleges that have reported involvement with special programs for the blacks, giving data also for their freshman class. The third graph down gives similar data for the remaining 32 colleges who have reported no involvement with special programs for blacks. The ordinate and abscissa for all three graphs are Percent of Engineering Colleges vs. White and Other/Black Ratio respectively. The dotted line represents the national population average of 8.26 White and Other/ Black Ratio while the average given represents the freshman student body in these engineering colleges, also in the same type of ratio.

2. As an example in reading these graphs, let's look at the top figure, Figure 1. This figure tells us that 17.2% of the 64 engineering colleges are reporting a freshman student body that would give a white and other to black ratio of between 50 to 75 to 1. This ratio could be 51 to 1 or 74 to 1; this example point represents one mode of this curve. The other mode occurs between 1000 and ∞, where 11% of the 64 colleges are reporting no blacks in their freshman class. The average shown tells us that these 64 colleges had a total white and other student body of 25,248 and a black student body of 417, thus giving an average of 60.5 whites to 1 black.

3. In comparing the modes for all three graphs we can see that special programs for blacks has shifted the mode from 50-75 to 25-50, while the second mode of 1000-∞ has disappeared completely, (Figure 2). For those colleges who have not attempted special programs, the first mode is back at 50-75 but the second mode has increased significantly at 1000-∞. (Figure 3, 11% goes to 21.9%).

FRESHMAN CLASS (1969-70)
(ENGINEERING)

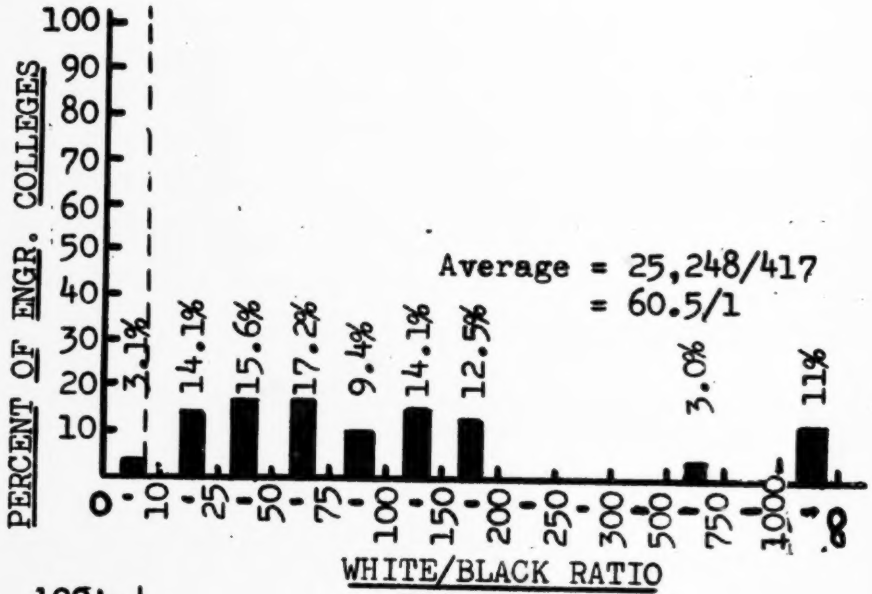


FIGURE 1

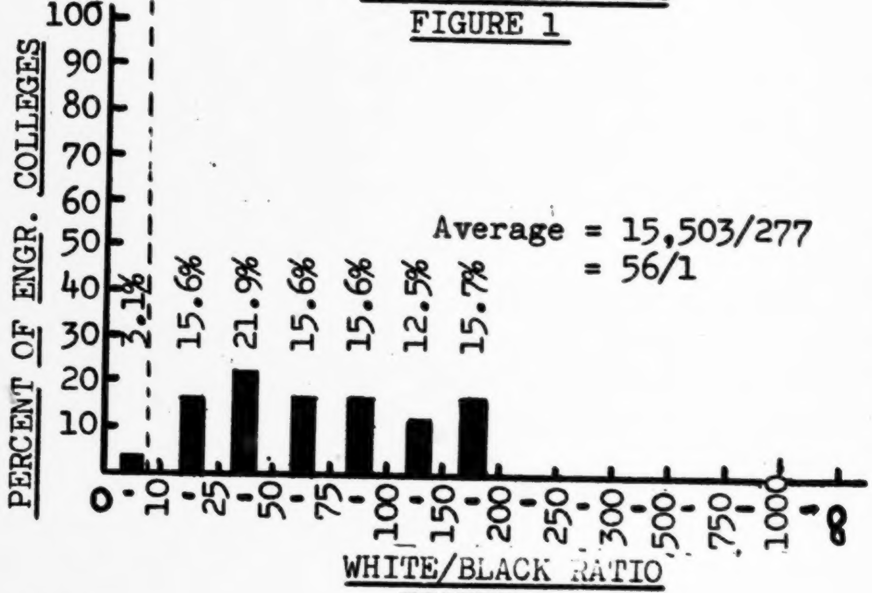


FIGURE 2

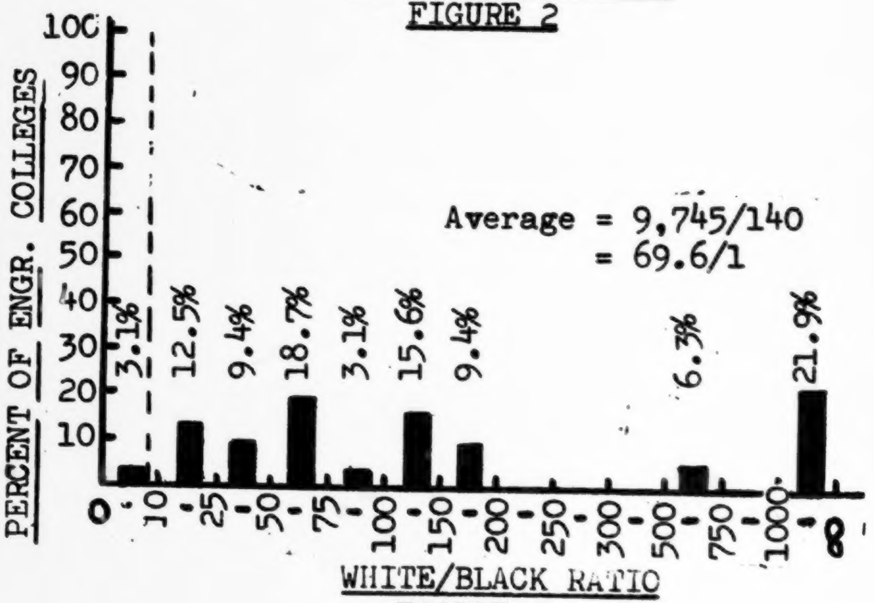


FIGURE 3

C. GRAPHS & INTERPRETATION (FIGURES 4, 5, 6 & 7)

1. The top graph (Figure 4) is a random sample of 72 ECPD Accredited Engineering Colleges for last year (68-69), giving a representation of the degrees awarded as related to blacks. The top average (115/1) does not include graduates of black colleges, while the lower average (79.4/1) does include these graduates. Notice again the two modes in this graph, one occurring between 100/1 and 150/1 while the second occurs at 1000-∞. It might be interesting to note that 61.1% of these 72 engineering colleges were reporting not one black in their graduating class. This data can be verified by looking in the January 1970 edition of the Engineering Education Journal on pages 403 and 404.

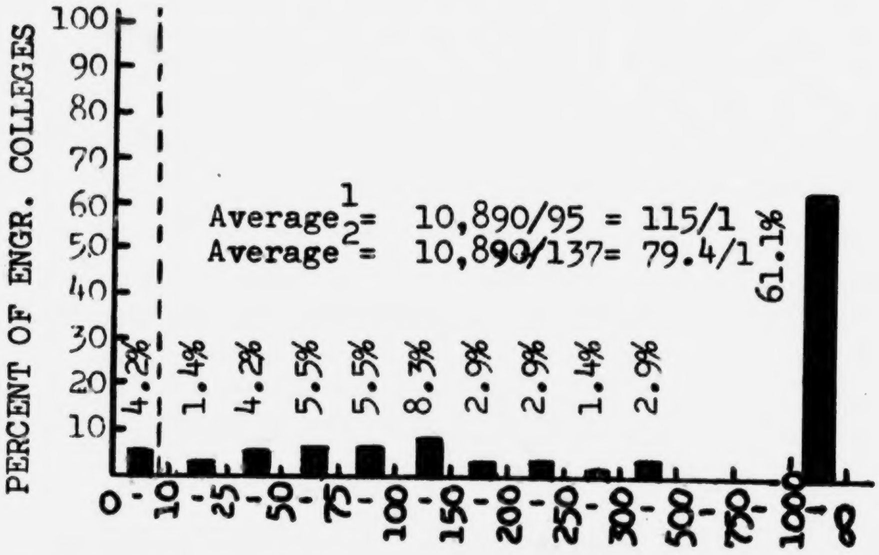
2. The next three graphs are broken up similarly to Figures 1, 2 & 3. Figure 5 represents the senior class of 66 ECPD accredited engineering colleges. The next figure down, Figure 6 separates from these 66 colleges 31 colleges that have attempted special programs for blacks. The last figure (Figure 7) gives the data for the remaining 35 colleges that have not attempted special programs.

3. First, notice the more favorable things that have happened from last year to this year. The 61.1% has dropped to 30.5% for the graduating class, (i.e., 30.5% of the engineering colleges not having one black in their graduating class), while the first mode increased significantly from 8.3% to 15.1% lying between 100/1 and 150/1.

Now let's look at the not-so-favorable aspect of comparing Figure 4 and Figure 5. From the data available in the Engineering Education Journal, i.e., of those ECPD colleges reporting graduating blacks, a student body of 10,890 is accounted for. It appears that the colleges are graduating 79.4 whites to one black. But yet the sample taken by this survey may give a more accurate representation of this average, because a student body of 18,887 is accounted for rather than the body of 10,890 from the data for last year. The average predicted for this year is that the ECPD accredited engineering colleges will graduate 125 white students to every one black student from their curriculum.

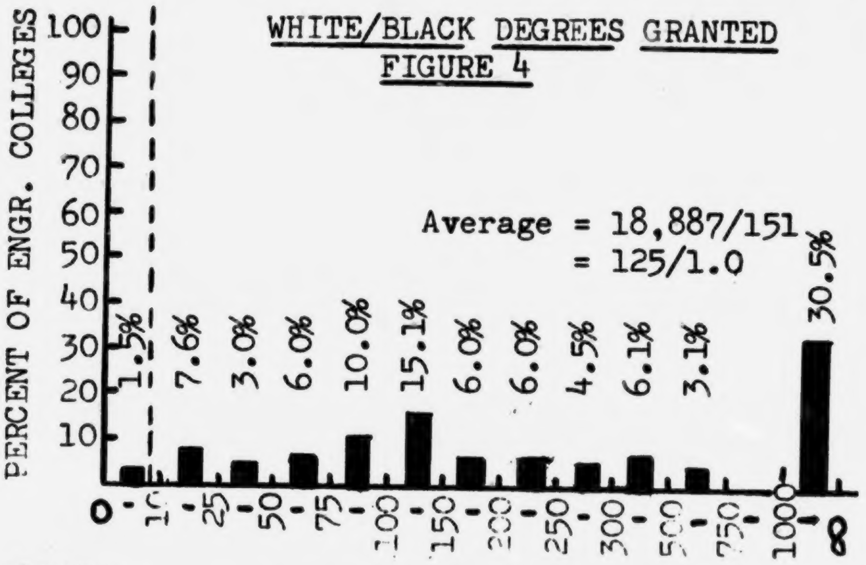
Notice how the graphs for the freshmen student body (Figures 1, 2 & 3) flatten out for the senior student body (Figures 5, 6 & 7). The comparison of Figure 1 with Figure 5 tells us that the drop-out rate for blacks is twice that for whites!! Of course, there may be many reasons for this drop-out, but the mere definition of the fact is phenomenal.

4. How have special programs for blacks helped the situation? Figure 6 shows that special programs have increased the mode lying between 100/1 and 150/1 from 15.1% to 19.4% and has decreased the second mode from 30.5% to 25.8%. The average, however, is greater (125/1 goes to 142/1) because the black colleges are not represented in this classification of colleges.



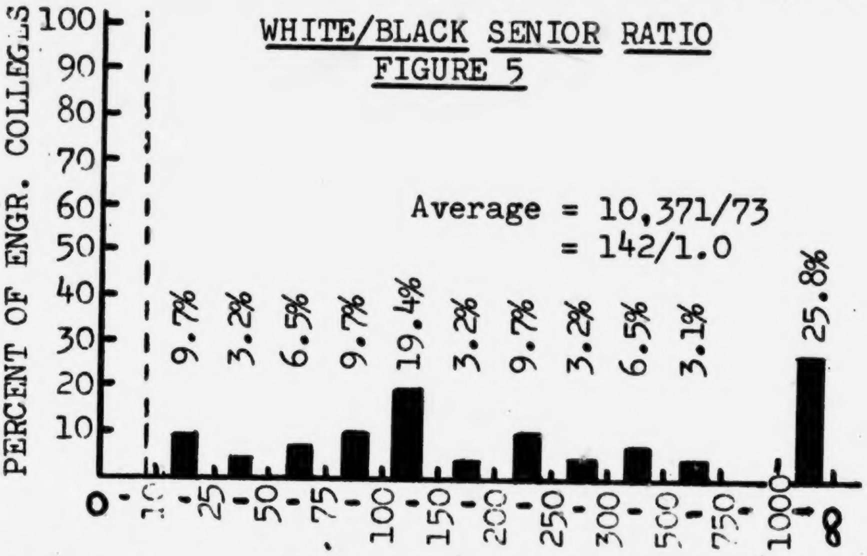
WHITE/BLACK DEGREES GRANTED
FIGURE 4

1968-69 GRADUATING SENIOR CLASS (ENGINEERING)

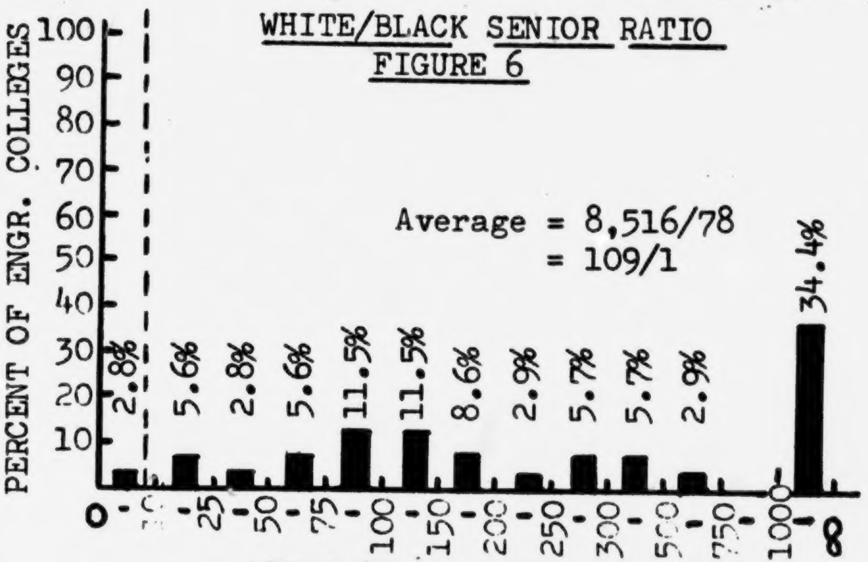


WHITE/BLACK SENIOR RATIO
FIGURE 5

1969-70 SENIOR CLASS
(ENGINEERING)
↓



WHITE/BLACK SENIOR RATIO
FIGURE 6



WHITE/BLACK SENIOR RATIO
FIGURE 7

C. GRAPHS & INTERPRETATION (FIGURES 8, 9 & 10)

1. These three graphs give data for the students in all four years of the engineering curriculum; a student body representing 85,575 white students, and 66 ECPD accredited engineering colleges. The second graph down (Figure 9) separates these 66 colleges into 32 colleges that have attempted special programs for blacks. The third graph down (Figure 10) gives the data for the remaining 34 colleges of the original 66.

2. Special programs for blacks have brought the overall average down from 95.4/1 to 88.8/1 and it is significant that this latter average does not include students of black colleges. They have also prevented the colleges from having a white/black ratio of ∞.

TOTAL UNDERGRADUATE STUDENT BODY
(ENGINEERING)

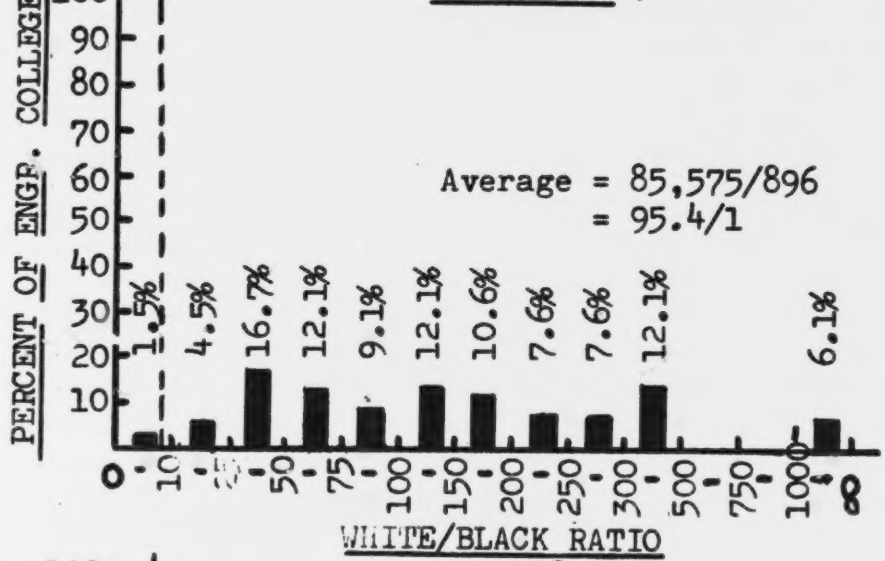


FIGURE 8

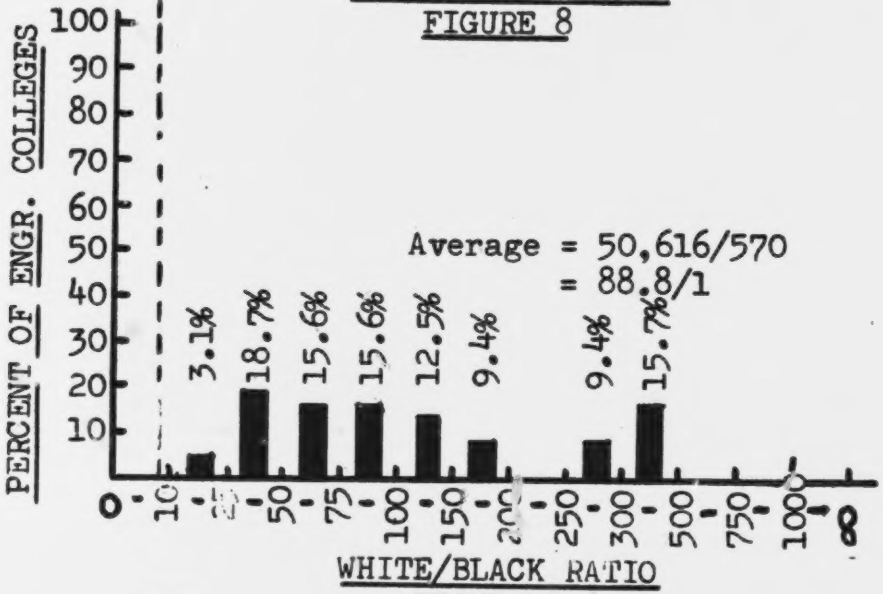


FIGURE 9

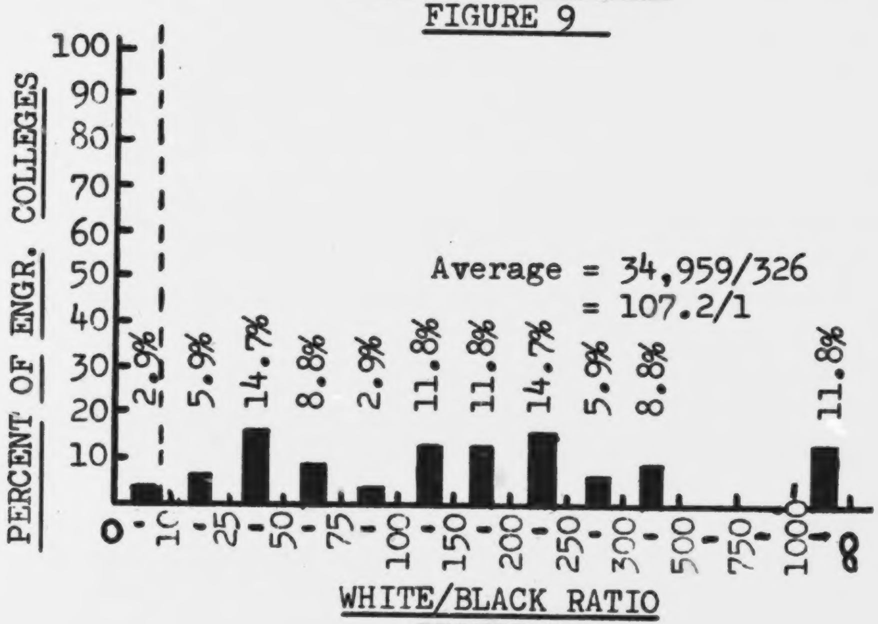


FIGURE 10

D. EDITORIAL COMMENTS

In reading over the comments of the deans of engineering, I see apathy manifested in these statements of feelings. These themes keep coming out: 1) don't treat blacks any differently; they are human as everyone is human, 2) blacks have not been paying the price of study and effort, 3) there is a risk of blacks becoming bad engineers. Apathy is present because there is a lack of emotional feeling for the situation of the black man. Empathy, however, is the opposite extreme of apathy. Empathy attempts to feel inside the black man as if you yourself were in his shoes. It is through empathy that his existential situation will tell you that something is seriously wrong with our educational procedures to allow 125 whites to graduate before the first black man comes through. It is through empathy that you can begin to feel for his people, 20 million of them, inheritors of freedom through the shackles of slavery and then, through the next century of belittlement and disrespect. Empathy is required of the engineering colleges to first accept the fallen condition of this man from the position of his white counterpart. The second requirement is that all hands be put together to lift him up from his fallen state. Empathy not apathy is needed of the engineering colleges.

In answering the first statement of the engineering deans, "Why treat him any differently than the Jews, Catholics, Protestants, etc.", let us first begin by saying that he already is being treated differently. The corporations are responding to society's demand to hire a negro but they are having a hard time of it. They go to the average ECPD accredited engineering college which is graduating 125 students and say "Give us the names of your black graduates". So the colleges gives out the name of their black student to 50 corporations, who hire him to fulfill their obligation to society. There is a need to separate the black man and treat him differently--not to treat him differently as he has been treated since 1620, but to begin now to treat him differently for the sake of rebuilding what has been lost through the centuries of oppression to his people in our nation.

Thus, logically follows my answer to assertions 2 and 3, i.e., of blacks not applying themselves to engineering and the risk of blacks becoming bad engineers. Empathy will tell you that this race of people is every bit as capable of technological thinking as any race upon this earth, except that they just haven't been given the chance!! Empathy will tell you to regard this man with respect for his potential, and his potential will only be tapped after the engineering colleges discover how to motivate him, and stimulate his interest toward the engineering profession. I can't accept that we must forget about him simply because he isn't coming to us. Neither do I accept that it is his fault because he isn't paying the price of study and effort. Perhaps he doesn't pay the price of study and effort because there are no other blacks in his class!! Or, perhaps he doesn't pay the price because his family and friends have drilled into him, "Only the smart white folk go into engineering. How can a dumb black boy like you ever climb that ladder?"

Empathy is first needed to isolate the racial conflict in our engineering colleges and to determine the reasons for it; the second step is to understand the social forces required to alleviate this conflict. The third step is to recommend solutions to the problem at hand.

II. QUESTION NO. 1--DO YOU FEEL THAT ENGINEERING IS A CRUCIAL MEANS OF UPWARD SOCIAL MOBILITY FOR THE BLACK PEOPLE?

(STATEMENTS FROM DEANS OF ENGINEERING)

A. APPROPRIATE BUT NOT CRUCIAL

"It is a very appropriate means but I would not say it is a crucial means."

"Engineering is not a crucial means but it is one of many possible avenues of social and economic advancement for all people."

"Engineering is certainly one means of upward social mobility for black people as well as for any other race. To suggest that it is a crucial means would be an unwarranted assumption."

"Engineering is one of the many avenues for upward mobility of the black people. It is most likely not a crucial means and even in white society it has not been thought of as a means of upward social mobility, but rather for the general betterment of the human race."

"The black should not be considered as separate from the human family. Given an opportunity at a good preparatory education, he should need no special consideration at the college level. He should--if information we have is any good--be able to make his contribution, along with those of other races, in any of the fields of specialization. There is nothing about him, as a black, which should make him any better an engineer or less better one, they anyone else."

"At least since the 1930's, there has always been a shortage of engineers. The profession has been what might be called a "wide-open" profession that always welcomed anyone who was qualified to be an engineer. I know of no profession that provides greater social upward mobility for black people than engineering. Membership in the professional engineering societies has almost always been open to anyone who qualified, regardless of race, religion, or creed."

B. GRAPHS & INTERPRETATION (FIGURES 11, 12, & 13)

QUESTION NO. 1--DO YOU FEEL THAT ENGINEERING IS A CRUCIAL MEANS OF UPWARD SOCIAL MOBILITY FOR THE BLACK PEOPLE?

1. The top graph, Figure 11, represents a sample of 81 ECPD Accredited Engineering Colleges. The next graph down, Figure 12, separates 37 colleges that have attempted special programs for blacks. The third graph down, Figure 13, represents the responses from the remaining 44 colleges with no special involvement with the blacks.

2. There is very little difference between these three graphs. The mode occurs favoring the "Yes" end, but yet a heavier distribution can be seen for those colleges with black involvement. (35% answer positively "Yes" and 40% answer favoring the "Yes" answer).

QUESTION NO. 1

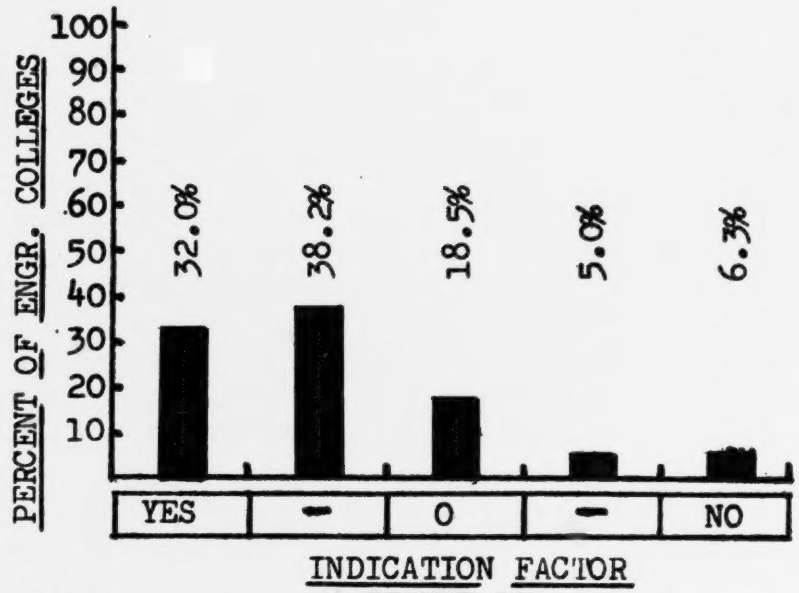


FIGURE 11

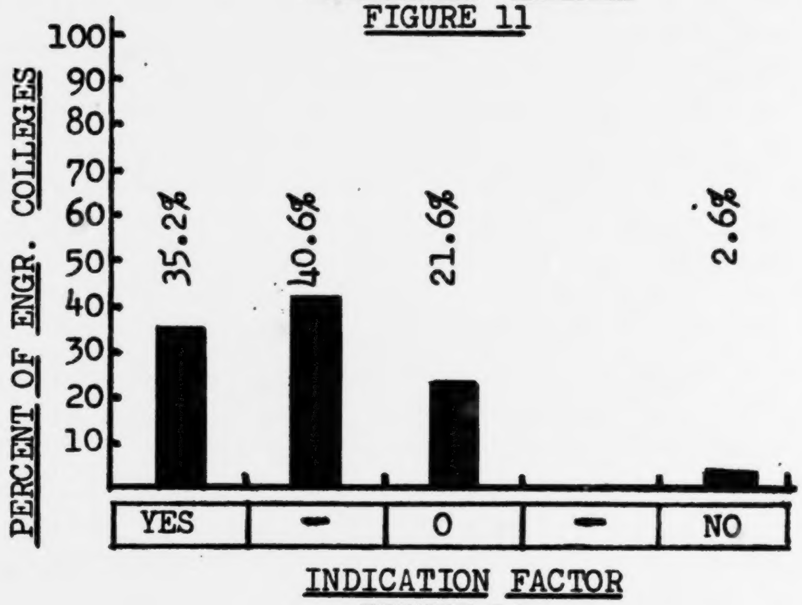


FIGURE 12

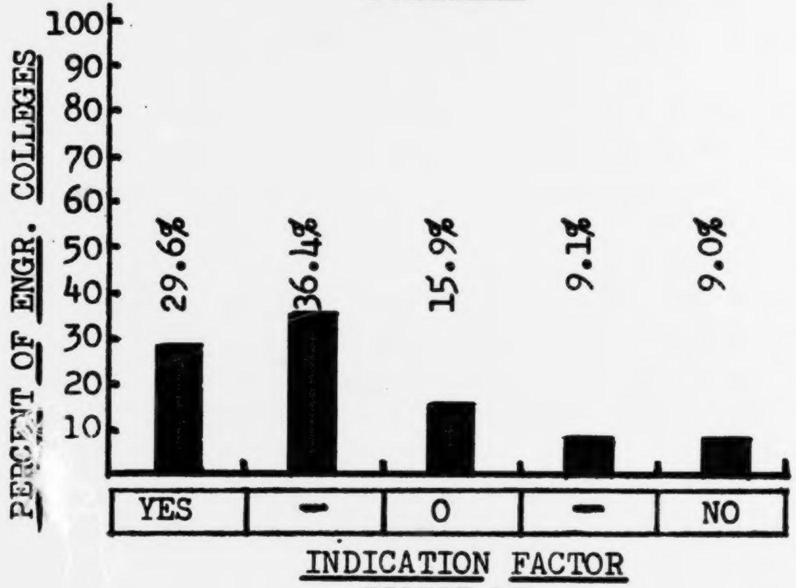


FIGURE 13

C. EDITORIAL COMMENTS

The word "crucial" is used here to ascertain how essential the deans feel the profession of engineering is to upgrade the social condition of blacks. The answers of the deans favor "Yes" rather than "No" for this answer.

The profession of engineering represents 2.6% of the total working class in our nation; and you may ask, "How can such a low percentage of people affect in an important or crucial way the social upgrading of an entire race?" The answer simply is we live in a technological society and engineering represents the utopia of the practical application of this technology; blacks have never been involved with this aspect of living under the vital and protective umbrella of having a technological capacity. People are known today by how they function in this huge social machine operating within our society. The technological gear is a main functioning gear; to have no working function with this type of living or functioning is a serious and burdensome handicap. This is especially true for the black man who has not been able to substitute another major function for this less able one, such as business or private enterprise.

It is interesting to note that one of the deans suggests that the profession of engineering is not necessarily a means of social upgrading but is thought of more for the general betterment of the human race. This may have been true thirty years ago, but today we can no longer say this. Our society has become saturated with the products of engineering and now the attention must be redirected to viewing the profession of engineering as a part of society itself rather than a separate entity merely making things for the society. The general betterment of the human race goes hand in hand with social upgrading; not just social upgrading of the power structure in control, but for all sections of the society. And this social upgrading does not merely include the things we make, but also includes the condition of respect and dignity for all people involved; it also includes how the people are able to use the things we make.

Again, as stated before, the deans are apathetic in attitude toward the black man. They refuse to separate him for the sake of helping him. They refuse to be sensitive to the needs and the fallen condition of the black race. And they refuse to accept the fact that the black man is not free to accept the profession of engineering with his own free choice. This is the theoretical freedom we presuppose he has, but it is not the freedom he experiences in actuality. Let's look more closely at his ghetto life, his family heritage and the education he has had!! The color of his skin is only symptomatic of a particular life style he has been forced into by our predominantly white society.

III. QUESTION NO. 2--DO YOU THINK THAT THE BLACK STUDENT HAS SOMETHING SPECIAL TO OFFER THE ENGINEERING PROFESSION FOR THE EVENTUAL COMBINING OF TECHNOLOGY WITH HUMANISM?

(STATEMENTS FROM DEANS OF ENGINEERING)

A. POSSIBLY, BUT NO MORE THAN ANY ETHNIC GROUP.

"Possibly to the extent that he would be familiar with living conditions and needs in black areas."

"Engineering is closely associated with humanism in that its goals and achievements are social, raise the standard of living of society, and expand our economy by providing greater opportunities for all. I think that good black, as well as good white, students have something to contribute to engineering in combining technology and humanism. I don't know that one race has something more special to offer than the other."

"No more than any other ethnic group."

"*Every* student, black, brown, red, yellow, or white, has something special to offer the engineering profession, including that of combining technology with humanism."

"The fact that the student is black does not necessarily give him something special to offer the engineering profession."

"All segments of our population are concerned with combining technology and humanism. I see no special contribution arising from the color of man's skin."

"Humanism has nothing to do with whether black students are involved or not involved."

B. GRAPHS & INTERPRETATION (FIGURES 14, 15 & 16)

QUESTION NO. 2--DO YOU THINK THAT THE BLACK STUDENT HAS SOMETHING SPECIAL TO OFFER THE ENGINEERING PROFESSION FOR THE EVENTUAL COMBINING OF TECHNOLOGY AND HUMANISM?

1. The top graph (Figure 14) represents a statistical distribution of the responses from 82 ECPD accredited engineering colleges. The next graph down (Figure 15) separates from this group 38 colleges that have attempted special programs for blacks. The last graph (Figure 16) gives the responses from the remaining 44 colleges that have no special involvement with the blacks.

2. It is significant to note that the response from Figure 14 is almost neutral (an off-balance of 1.2% (13.4+24.4-13.4-23.2) favoring the "No"). However, for Figure 15, this off-balance shifts to the "Yes" answer giving an off-balance of 13.1% favoring the "Yes" answer. But, for the deans who have had no special involvement with the blacks, the answer shifts to almost the same off-balance on the "No" side (13.7%).

3. The "something special" could mean to the deans any special characteristic of the black man arising from his history and life style that could be considered an asset to the profession of engineering. This "something special" was not defined in the questionnaire.

QUESTION NO. 2

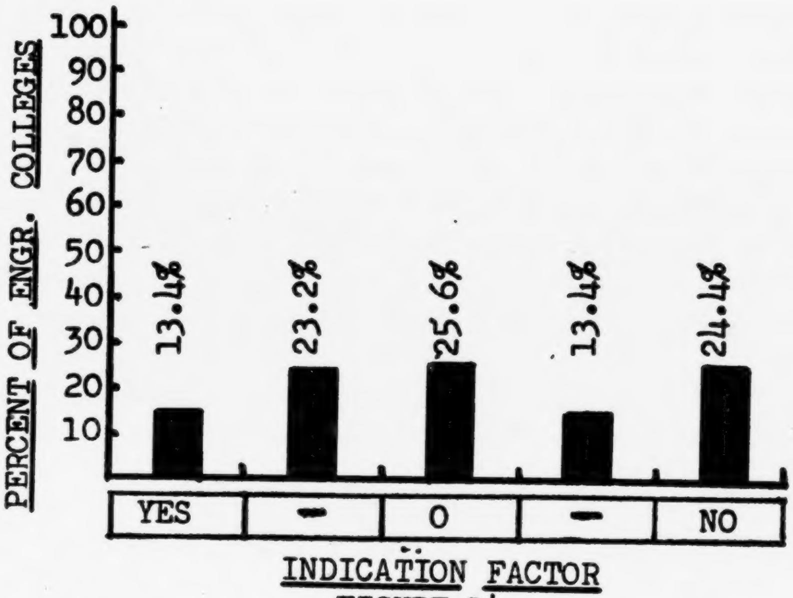


FIGURE 14

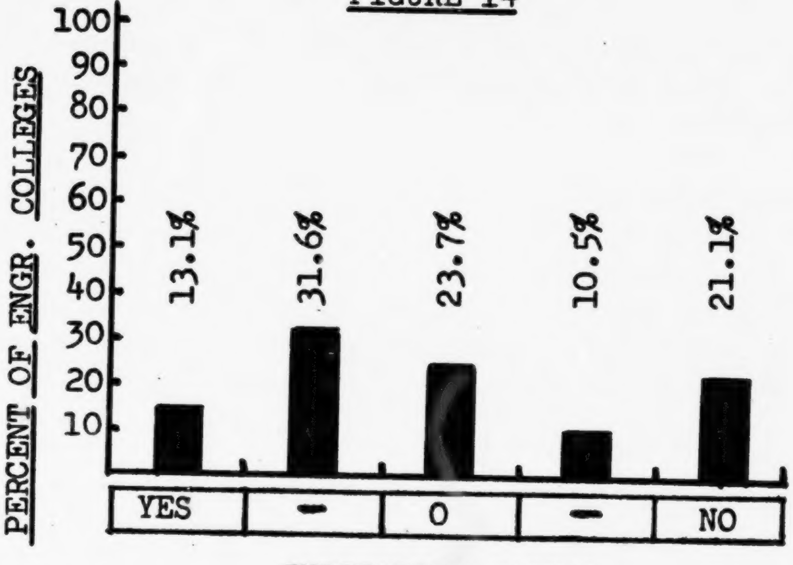


FIGURE 15

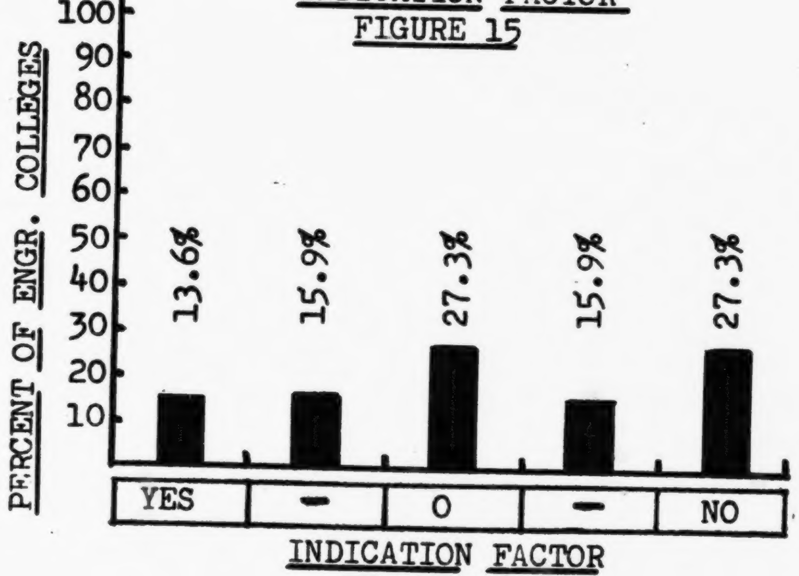


FIGURE 16

C. EDITORIAL COMMENTS

The German existentialist philosopher, Martin Heidegger, breaks thinking into two categories: 1) primordial (or essential) thinking and 2) calculative thinking. He writes that calculative thinking is the type occurring in the sciences which is hardly thinking at all; it is similar to the thinking of machines.[1] However, on the other hand comes the essential thinking or primordial thinking which is a thinking that listens for an occurrence of being in the person who thinks. In primordial thinking, the being of the Human Dasein (or universal man) speaks to the person, and he listens.

Question No. 2 stems from Martin Heidegger's separation of types of thinking. The "essential" thinking is similar to the expression "soul" currently being used by the blacks to describe a certain aspect of their life style; a life style that has been sharpened by social suppression in our society since 1619, when the first 20 blacks arrived in Virginia aboard a Dutch ship. It isn't by accident that most blacks today go into some type of social work. It is because society has forced them into this one particular mold and has sharpened to a high degree their social awareness and ability of expression.

The point that Question No. 2 is attempting to raise is the benefit to the profession of engineering of linking the essential, primordial or soul style of thinking, with its high degree of social awareness, to the calculative or cognitive style of thinking, with its low degree of social awareness. The end result would be a well rounded profession and individual--both of which would be a great asset to our society.

However, the thinking of the deans goes no deeper than the color of the man's skin. Of course, the color of a man's skin makes no difference; this is only symptomatic of a much more fundamental and essential difference, his heritage. I think that it is very significant that not one written response even referred to the "soul" concept, as familiar as it is in the current usage.

Let not this concept of "soul", however, make the black man a less able or efficient engineer. On the contrary, let him develop to his fullest potential in technology; don't force him to assimilate into the existing power structure but absorb him as a black man and educate him as a black man. Develop the richness of his heritage and let him respect himself as a black man. He is as capable of technological thinking as any man on earth, except that he has not been given the chance.

---

[1] Macquarrie, John, Martin Heidegger, John Knox Press, 1968.(pg. 47)

IV. QUESTION NO. 3--DO YOU FEEL THAT THE BLACK COLLEGES CAN ADEQUATELY TRAIN ENGINEERING STUDENTS FOR WORK IN OUR EXISTING BUREAUCRATIC CORPORATIONS?

(STATEMENTS FROM DEANS OF ENGINEERING)

A. SOME CAN

"Some colleges."

"Some black colleges can now adequately train engineering students for work either in existing bureaucratic corporations or in existing nonbureaucratic corporations."

"Some."

"I see no reason why they cannot. Is it not now being done?"

"Bureaucratic? Some are but not all."

"If they have an ECPD accredited program."

"I do not know much about capabilities of black colleges."

"I am not familiar with the engineering programs in black colleges. If they met ECPD accreditation standards, I would think the black students would have no difficulty in working for existing corporations."

B. RESTRICTED

"The average graduate of a black college is not adequately prepared to enter the engineering profession. In some instances, an additional year of undergraduate study at a good engineering college is required. This does not mean that the black engineering colleges do not perform a useful service. Actually, they are extremely useful in providing a means whereby the black student who is relatively unprepared to enter a first-class engineering school can receive the type of education which prepares him for advanced undergraduate work in a first-class engineering school. The black engineering college moreover provides this opportunity in a setting in which an underprivileged black student is relatively comfortable. I strongly favor the continued existence and the further development of predominantly black engineering schools as well as increased enrollment of well prepared black students in predominantly white engineering schools."

"Black colleges could train engineers very well. The big problem with the black colleges unfortunately is that they have not in general had faculty of good quality in engineering and have been more technician rather than profession oriented. As soon as qualified faculty are developed, they should be able to do a good job."

"Black colleges by the very nature of their segregation are apt to be inferior to integrated ones. We have exactly the same problems regarding our Indian students, of which we have a sizeable number. An all-Indian school will not develop these as we can on our integrated campus.

C. HIDDEN IMPLICATION

"Your use of the term "bureaucratic corporations" seems to carry a hidden implication of racial discrimination. If so, this is unfortunate. Predominantly black colleges with programs of the quality of those at (------) and (------) provide adequate training as is clearly indicated by the demand for the graduates on the part of major corporations.

"Not clear, quality or numbers."

"Loaded question (bureaucratic)."

"Phrasing of questions makes them 'loaded'."

"I am not sure what you mean by 'bureaucratic corporations', as opposed to the garden variety of corporations."

D. GRAPHS & INTERPRETATION (FIGURES 17, 18 & 19)

QUESTION NO. 3--DO YOU FEEL THAT THE BLACK COLLEGES CAN ADEQUATELY TRAIN ENGINEERING STUDENTS FOR WORK IN OUR EXISTING BUREAUCRATIC CORPORATIONS?

1. The top graph (Figure 17) represents a statistical distribution of the responses from 77 ECPD accredited engineering colleges. The next graph down (Figure 18) separates from this group 36 colleges that have attempted special programs for the blacks. The last graph down (Figure 19) gives the responses from the remaining 41 colleges that have had no special involvement with the black students.

2. It is significant to note that the response from Figure 17 favors the "No" by an off-balance of 15.6% (16.9+28.6-13.0-16.9) but this increases to 36.1% for the colleges who have had special involvement with the black students (Figure 18). However, for the colleges who have had no special involvement with the black students, their answer is "Yes" by 2.1%.

3. The word "bureaucratic" caused difficulty for some deans. It is not used here in a negative sense, but is used in the sense described in the editorial comments for this section.

QUESTION NO. 3

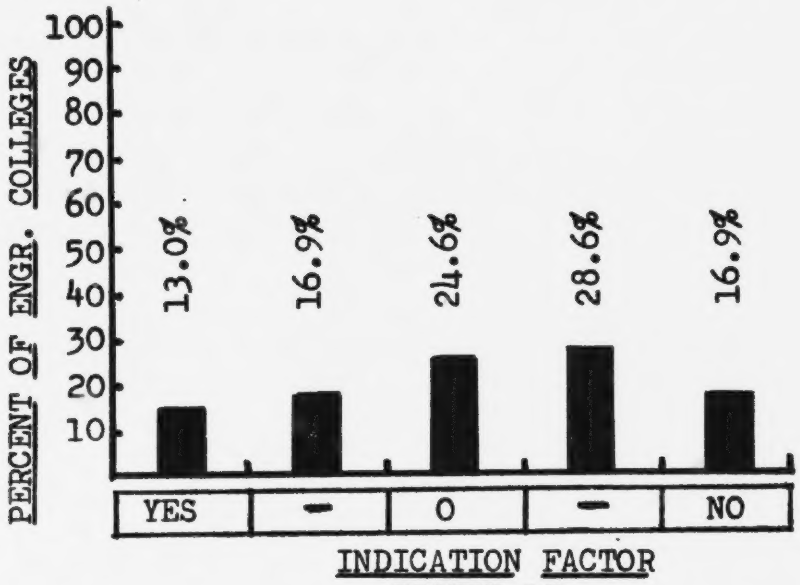


FIGURE 17

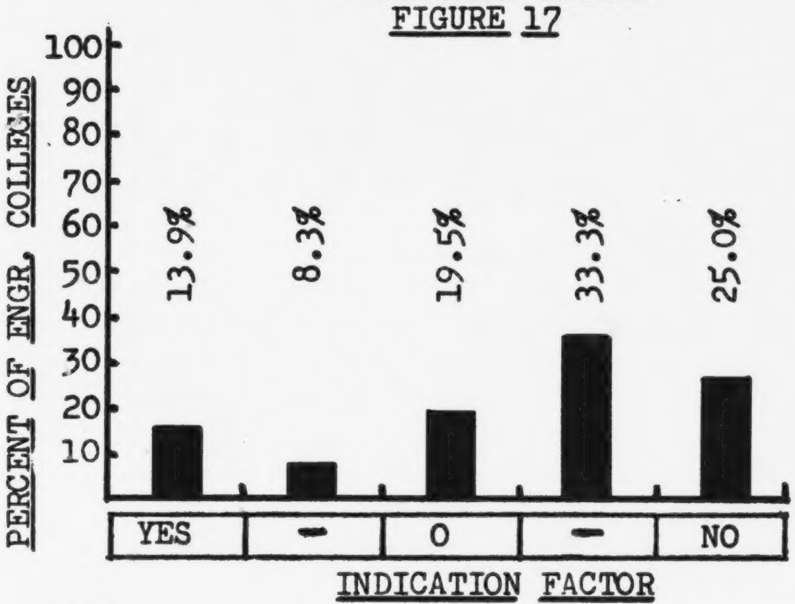


FIGURE 18

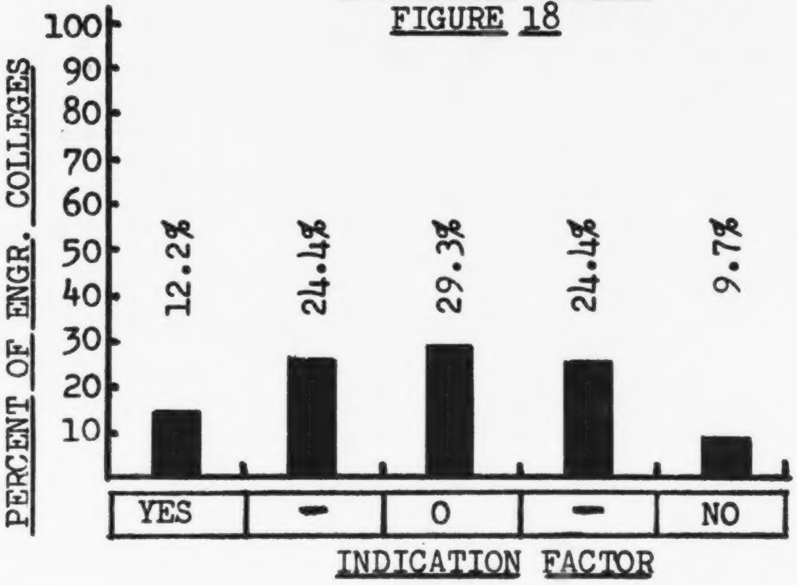


FIGURE 19

D. GRAPHS & INTERPRETATION (FIGURES 4-A, 4 & 4-B)

1. The top graph (Figure 4-A) is a random sample of 109 engineering colleges of which 72 are ECPD accredited and 38 are not accredited by ECPD standards. Of the 72 colleges, 2 are black colleges, and of the 38, 4 are black colleges. This graph represents the engineering degrees given out last year as related to blacks (68-69 academic year). All of this data can be verified in the Engineering Education journal, January 1970 edition, on page 403-405.

The top average given for the white to black ratio (104/1) does not include graduates of black colleges, while the lower white/black ratio (43.6/1) does include graduates of black colleges. Again, the dotted line represents the national population average of 8.26 white men to every black man in our nation.

The next graph down (Figure 4) separates from the 109 colleges and gives only the frequency distribution for the 72 ECPD accredited colleges. The top average of 115/1 is the white/black average for 70 of the 72 colleges that are predominantly white. The lower average 79.4/1 represents the average of the 70 white colleges plus the two black colleges, all of which are ECPD accredited. This graph is the same as Figure 4 on page 18 .

The last graph down (Figure 4-B) represents the frequency distribution of the 38 colleges that are not accredited by the engineering profession, ECPD. 34 are predominantly white while 4 are black colleges. The top average of 75.3/1 does not include the graduates of black colleges, while the lower average of 15.5/1 does represent the average including the black colleges.

2. It is significant to note that in all three graphs over 50% of the engineering colleges are reporting not one black man in their graduating class. It is also worthy to note the difference between Figures 4 and 4-B. The difference between these two graphs spells only one thing, a form of institutional racism existing within our engineering colleges.

1968-69 GRADUATING SENIOR CLASS (ENGINEERING)

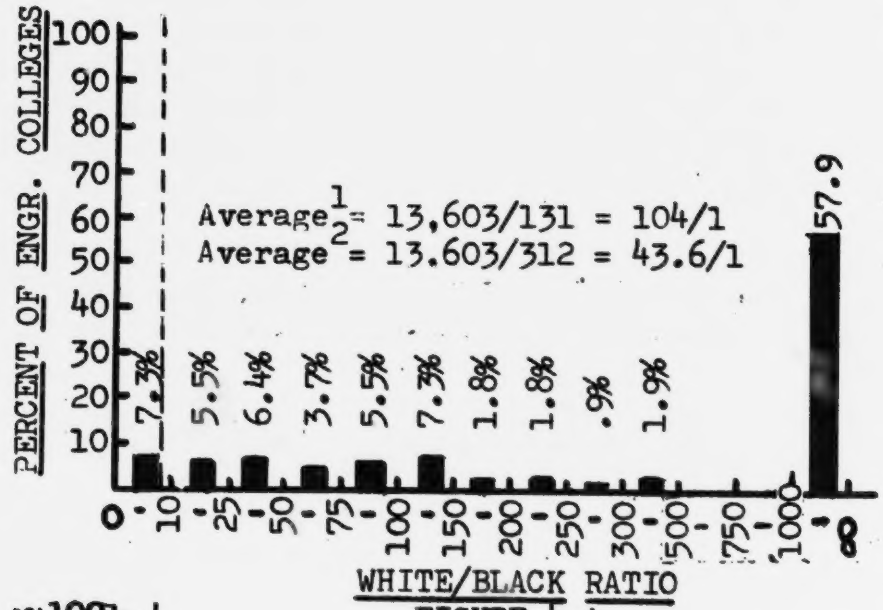


FIGURE 4-A

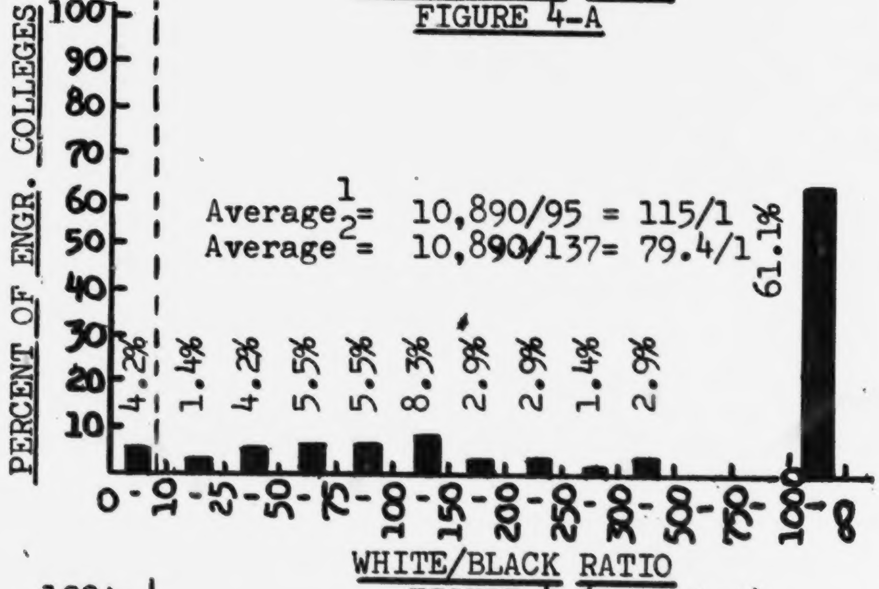


FIGURE 4 (Repeated)

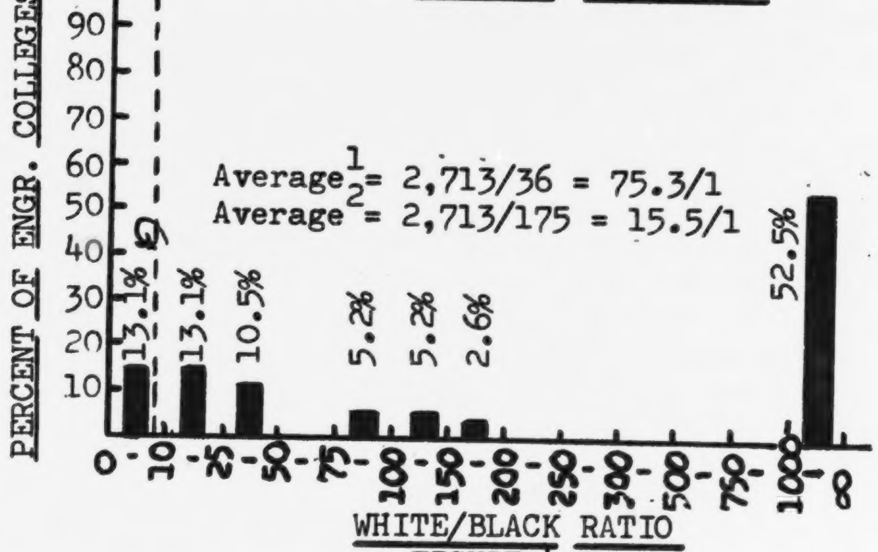


FIGURE 4-B

E. EDITORIAL COMMENTS

"Bureaucratic Corporations" is used here to describe a social institution that exists within our society. It is defined by Webster's Third International Dictionary (1966) as: "Bureaucracy--a systematic administration characterized by specialization of functions, objective qualifications for office, action according to fixed rules, and a hierarchy of authority". The question does not assume that all corporations are bureaucratic in nature.

The term bureaucracy does not necessarily mean a disease or sickness within a healthy body--it becomes this only under the conditions of violation to human dignity and to human values if they become meshed in the machinery of the bureaucracy. However, the point that is constantly appearing within this report is that it is the corporations who are desiring the blacks. Perhaps it because of their sociological committment, but in any case, it is the corporations who are forcing the engineering colleges to become more empathetic toward the black man.

The full ramification of this question is realized when one understands that from 1920 to 1962, out of 10,209 total doctorates given in engineering, only three of these were black. (American Negro Reference Book, Prentice Hall, 1966, pg. 565)

In the academic year 1968-69 only two out of a total of 3,387 engineering doctorates reported were identified as going to U.S. Negroes (Engineering Manpower Commission of Engineers Joint Council).

Since the doctorate is the life line for engineering education by ECPD standards, how can the black colleges possibly be top-rated colleges? Unless of course the professional colleges support the black colleges with top-rated faculty and standards.

The other restriction for the black college is the same as the white college. A well balanced cross section of the society is not represented in the learning process, a definite disadvantage to a person who must work in that society. The entire concept of white and black engineering colleges in this age of scientific intellectualism is repugnant and archaic!!

In reflecting upon this question, the analogy of a bus ride can be made. The bus is the engineering profession and is parked in the station with a destination sign on it reading "to Betterment of Mankind via Natural Laws of Physics". 100 people get on the bus, 97.8 of them are white, while 2.2 are black. 78 whites and one black take seats in the first class section of the bus (the ECPD accredited engineering college graduates) while 19.8 whites and 1.2 blacks take seats in the second class section of the bus (the non-professionally recognized college graduates).

Prior to entering the bus, the two blacks had an argument with their high school counselor regarding the destination of the bus. The counselor told them to take any of the buses leading to medicine, religion, nursing or teaching but not to take the bus going to "Betterment of Mankind via Natural Laws of Physics". He argued that the latter bus would only lead to much hard work with little respect and dignity in the corporations. He pleaded with them further, and related stories that he had heard of worker unrest and low productivity when a black man was placed over them. He also related an incident involving a black draftsman who was expected to produce 25% more output at an average lower pay just to prove his worth as a black man. He said that Professor Jensen had proven without a doubt that their I.Q. was 15 points lower in abstract thinking so why buck the mainstream. He emphatically pleaded that what they really needed was respect and dignity and not hard work with frustrations, but the two blacks took the bus anyway.

The big bus rumbled out of the station. It rolled over the hillside of Vietnam striking down a half million Vietnamese. The two blacks looked out of the mud-splattered windows and saw 100 dead American soldiers lying on the ground; 12 were black with signs on their chests reading "Died for our Country". Leaving Vietnam, with track imprints the size of airfields, the big bus rumbled through Harlem, Newark, Detroit, Chicago and the Watts section of Los Angeles, coughing blue diesel fuel fumes, choking the inhabitants of the riot torn streets. Thousands of blacks scrambled to the door of the bus, whereupon the driver was obliged to tell them, "This bus is going to the Betterment of Mankind only through the Natural Laws of Physics; really, it will be for your own good!! You will have bigger and better cars, highways and bridges. We may even be able to rebuild your city in half of the time it originally took." But they cried through the door, saying, "We have never traveled by way of Natural Laws of Physics, but if you are really heading for the Betterment of Mankind and if it will offer us respect and dignity, let us travel with you." But the driver was obliged to tell them, "The way of Natural Laws of Physics is too difficult for a beginner; I'm sorry, for you will have to take another bus".

The big bus moved on. It passed by 100 new-born black infants; four of them were dead. Two of the dead had signs on their chests reading, "Died from a lack of care". It passed by a group of 100 black working men, 46 had full-time jobs for the year (8 were unemployed). It rolled over the countryside passing billboards reading, "Help your country, feed the 14 million hungry, malnourished citizens". It rolled by corporations who shouted to the driver, "Hey, Pal, got any blacks in there?". And it rolled, and rolled, growing in speed with each minute, to reach its destination of Betterment to Mankind via the Natural Laws of Physics.

V. QUESTION NO. 4--DO YOU FEEL THAT THE EXISTING BUREAUCRATIC CORPORATIONS AND THE ENGINEERING SCHOOLS CAN ADAPT TO THE NEEDS AND ASPIRATIONS OF THE BLACK STUDENT?

(STATEMENTS FROM DEANS OF ENGINEERING)

A. ONE WAY

"In my opinion the black student must learn to adapt to the existing system. The majority of those that I have met in engineering do not ask for or want special consideration."

"Difficult for private institutions".

B. TWO WAYS

"Corporations and schools will adapt, as they have in the past, to the needs and aspirations of the various segments of the population. In the case of black people, this will largely come about (as it has with other people) by the leadership role played by black people operating within corporations and schools."

"Adaptation must come from both directions, not only from industry or education. This question is worded to assume that corporations are entirely bureaucratic. There is no reason why engineering schools cannot do a good job in teaching good black students, and there is no reason why good black engineers will not be highly acceptable in corporations. We have graduates here who have been highly acceptable. We have a cooperative education program with industries, and black students are desired by the industries. There is no problem in placing them."

C. UNCERTAIN ABOUT NEEDS

"The problem here is the word 'aspiration'. I fear the black himself does not know what his aspirations are, and certainly we cannot adapt our schools to such unknowns."

"I am certain they can adapt to the needs. I am not sure that anyone at that point is sure what the aspirations are."

"If they are honest professional needs and aspirations--'free-loading', no."

"The wording of your question implies that black engineers have different needs and aspirations than white engineers. My experience with engineers of many races indicates no basic differences. There are different educational needs for students who plan to practice engineering in underdeveloped countries but not among those who will work in the United States."

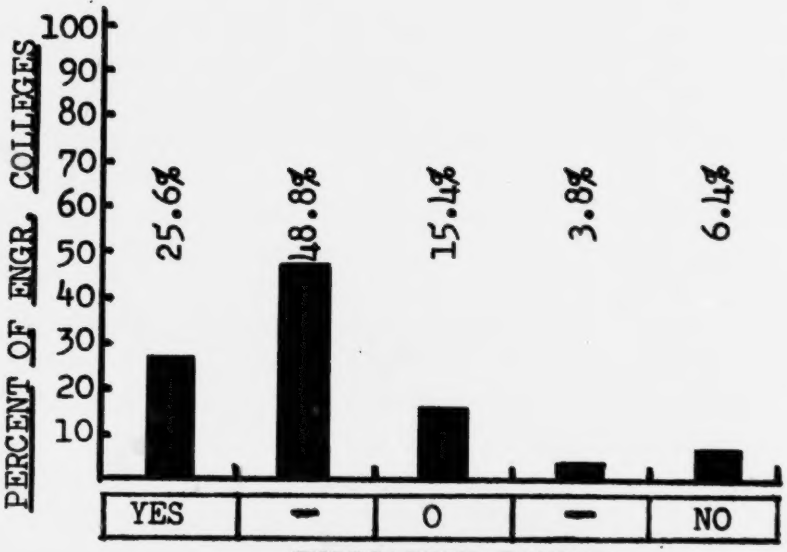
D. GRAPHS & INTERPRETATION (FIGURES 20, 21 & 22)

QUESTION NO. 4--DO YOU FEEL THAT THE EXISTING BUREAUCRATIC CORPORATIONS AND THE ENGINEERING SCHOOLS CAN ADAPT TO THE NEEDS AND ASPIRATIONS OF THE BLACK STUDENT?

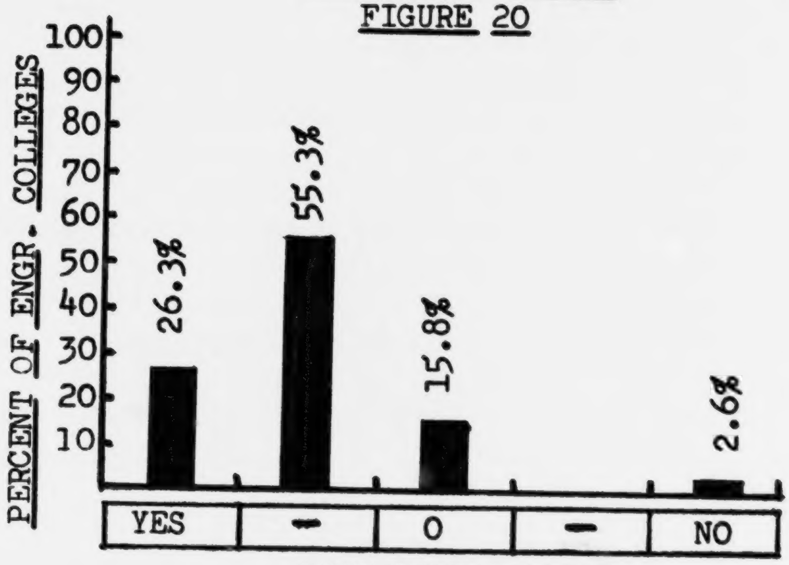
1. The top graph (Figure 20) represents a statistical distribution of the responses from 78 ECPD accredited engineering colleges. The next graph down (Figure 21), separates from this group 38 colleges that have attempted special programs for blacks. The last graph down (Figure 22) gives the responses from the remaining 41 colleges that have had no special involvement with the blacks.

2. It is significant to note that the responses from all three graphs favor the "Yes" answer. For the total response (Figure 20) the off-balance is 64.2% favoring "Yes", for Figure 21, the off-balance is 79.0% favoring "Yes", and for the remaining colleges (Figure 22) the off-balance is 50% favoring the "Yes" answer.

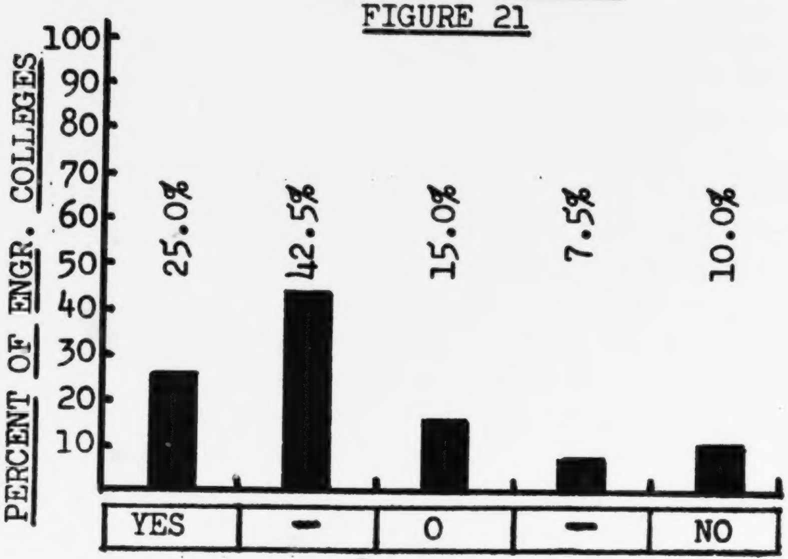
QUESTION NO. 4



INDICATION FACTOR
FIGURE 20



INDICATION FACTOR
FIGURE 21



INDICATION FACTOR
FIGURE 22

E. EDITORIAL COMMENTS

From the graphs (Figures 20, 21 & 22) a very important phenomenon is outstanding; the majority of deans feel that the corporations are receptive to the black man, and this includes even that rigid form of corporation with bureaucratic administration!! But this is even more apparent from those engineering colleges who have specialized actively in the education of black students. Of this latter group (Figure 21) almost 80% of the deans say that the corporations and colleges are highly receptive to the black student. Perhaps at this point we should speculate regarding reasons for such feelings on the part of these deans. My thesis is that those colleges which are intentionally isolating the black student to increase his chances for graduation are doing so because of the corporations. In other words, these colleges are complying with the rule of supply and demand. The corporations are demanding black engineering graduates; but they do not want poor grade engineers. The deans on page 32 are indicating that, from their eyewitness experience, the graduates of black colleges are really not up to par with the graduates of first class engineering colleges, at least by the standards of our predominantly white society. Thus, unless the ECPD colleges develop means of educating the black man and increasing his chances for graduation, then the corporations will be the ones to pay!! But, incidentally, the black graduate will pay even worse. If the corporations continually demand black graduates only to continually receive poorly prepared engineers by society's standards, then the age-long plague of the black race will continue. The corporations will attribute a natural link between engineering inferiority with the black color of a man's skin. This, by the way, is the same link a majority of the deans are making throughout this report. It is a shallow and superficial connection with no regard to reasons behind the engineering inferiority.

The second part of the question relates to the needs and aspirations of the black student. The deans on page 39 are confused about what the needs and aspirations of the black student really are. This uncertainty only exemplifies the general apathy for the black man shown throughout this report. If these deans were really feeling for the black man as if they themselves were in his shoes, then there would be no question about his needs and aspirations. If these deans throughout their lives walked into restaurants only to be refused service because of the color of their skin, of if they walked the streets for a job and were refused a means of living to support their family because of their color, then the black student's needs and aspirations would be more apparent to them. Or, if they walked to the engineering colleges desiring help and guidance in a very perplexing and confusing world, only to be turned away because they were born in the black city ghetto or in a shack in the south (and, by the way, the schools aren't very good in these places) then there shouldn't be any question about their needs. 54% of all blacks live in the south while the majority of the remainder live in 8 major cities in the north.

From the special report on Graduates of Predominantly Negro Colleges (class of 1964) published by the U.S. Department of Health, Education and Welfare, publication No. 1571, 1,217 male graduates of Negro colleges were asked what job characteristic was considered most important to them. 80% answered "to be helpful and useful". The same question was asked of 3,138 male white graduates, wherein only 50% answered "to be helpful and useful". (page 137) Isn't it a tragedy of our sacred American tradition of freedom and justice for all that a whole race of people feel unwanted and unneeded by the existing majority?

In 1781 the heads of Prussia told the Jews of that country to divest themselves of Jewish traditions and customs so that they could be assimilated into the Prussian power structure.[1] Many Jews did. They gave up allegiance to their heritage and customs for the sake of being wanted and needed by the existing power structure and by the majority in control. They would not even associate with their fellow "Jews"; the descendants of these people fought in World War I with valor and honor, they gave up their Jewish allegiance for the sake of being wanted and needed. The same people walked to the gas chambers in Germany to be made into bars of soap, flashing their medals of honor to the German gestapo, and crying, "I'm not a Jew, I am a German. See my medal, I fought for you!" They were assimilated into the existing power structure with their corresponding lack of identity and the most horrible atrocity of our time was committed. Where was the empathy of the German power structure?

Of course the needs of blacks are no different than any other group. Everyone wants to be needed and wanted by the society. But not all groups are needed and wanted to the same degree. The key to the aspirations of the blacks is to be needed and wanted but at the same time to retain their "black" identity. Most of the blacks do not desire assimilation with the resultant loss of their culture, heritage and tradition. They desire absorption into the society, but as blacks, giving to that society their special contribution. The phrase "black is beautiful" is indicative of this special feeling coming out in our times.

---

[1] Arendt, Hannah, The Origins of Totalitarianism with reference to Christian Wilhelm Dohm's Toward the Amelioration of the Status of the Jew, (1781).

VI. QUESTION NO. 5--DO YOU FEEL THAT THE PREDOMINANTLY WHITE ENGINEERING COLLEGES UNDER THE AUSPICES OF ASEE SHOULD ATTEMPT TO ENCOURAGE BLACK HIGH SCHOOLS TO PROVIDE ADEQUATE CURRICULUM AND COUNSELING FOR THE CHANNELING OF SOME BLACK STUDENTS INTO THEIR ENGINEERING PROGRAMS?

(STATEMENTS BY DEANS OF ENGINEERING)

A. FAVORING THE IDEA

"The main reason that so few black students graduate in engineering is that their high schools have not prepared them adequately to compete in the curriculum."

"We need to get as representative a group of young America as we possibly can in all of our better schools. The real problem is getting better training in the lower grades."

"I earnestly hope that great efforts will be made to provide adequate curriculum and counseling that will enable black students to enter the engineering profession."

"I favor the idea, but fail to see why ASEE should be involved."

B. EFFORTS OF BLACKS IMPORTANT

"This should be left to the choice of the student. You can't develop an engineer from someone who doesn't want to be an engineer."

"Naturally such efforts are aided tremendously by efforts of black engineering students and black engineers (see attached information) regarding ASTEC program."

C. ALL HIGH SCHOOLS

"And white ones too."

"I believe that all high schools should provide adequate curricula and counseling to channel qualified students into the engineering profession."

"I think this is true and I also think that encouragement and counseling can be given to other high schools as well. We should attempt to develop all potential students regardless of race."

D. GRAPHS & INTERPRETATION (FIGURES 23, 24 & 25)

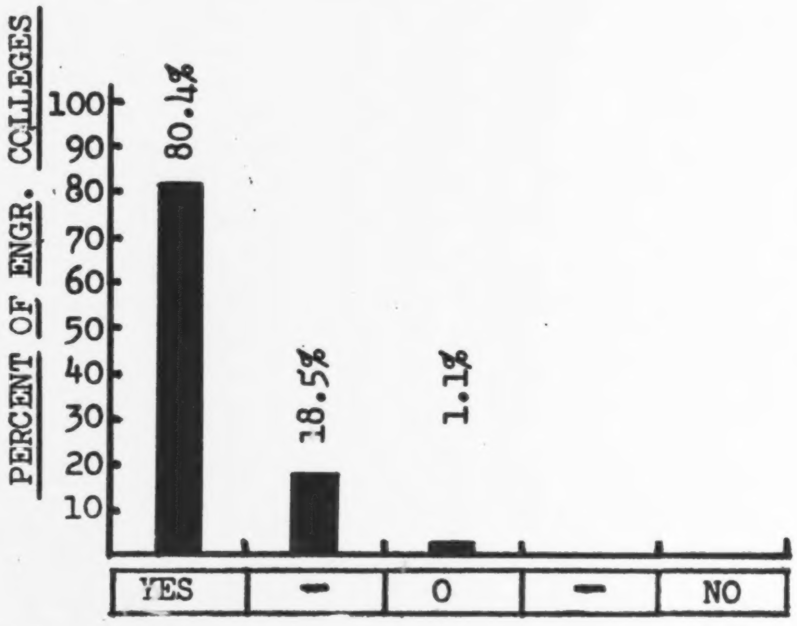
QUESTION NO. 5--DO YOU FEEL THAT THE PREDOMINANTLY WHITE ENGINEERING COLLEGES UNDER THE AUSPICES OF ASEE SHOULD ATTEMPT TO ENCOURAGE BLACK HIGH SCHOOLS TO PROVIDE ADEQUATE CURRICULUM AND COUNSELING OF SOME BLACK STUDENTS INTO THEIR ENGINEERING PROGRAMS?

1. The top graph (Figure 23) represents a statistical distribution of the responses from 81 ECPD accredited engineering colleges. The next graph down (Figure 24) separates from this group 38 colleges that have attempted special programs for blacks. The last graph down (Figure 25) gives the responses from the remaining 43 colleges that have had no special involvement with the blacks.

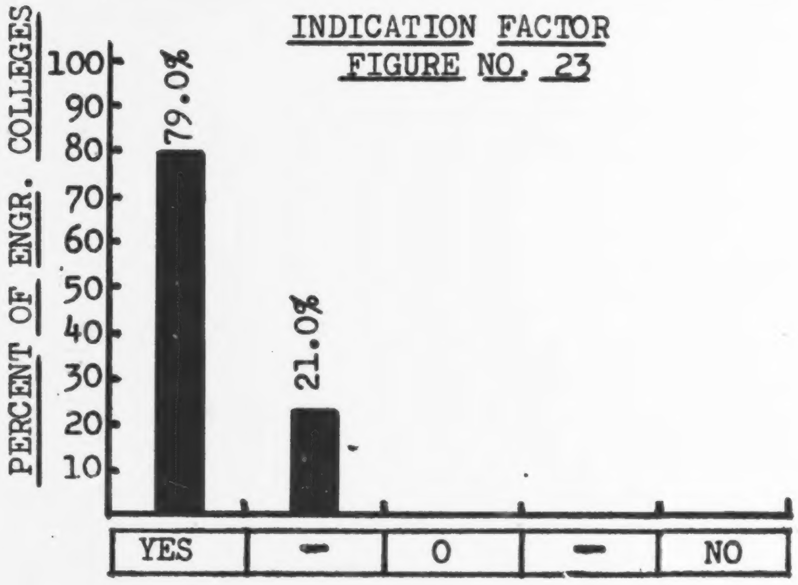
2. It is highly significant to note that the overwhelming answer from all three graphs favor a firm and positive "Yes". For the total response (Figure 23) the off-balance is 98.9% favoring "Yes" and for the colleges with special programs for blacks the response (Figure 24) is solidly 100% favoring the idea. The remainder of the colleges with no special programs for blacks are also enthusiastic about the idea, 97.7% of them answering "Yes" (Figure 25).

This report is recommending that a faculty transfer between the colleges and high schools be formulated in a nation-wide effort to accomplish what is suggested by this question.

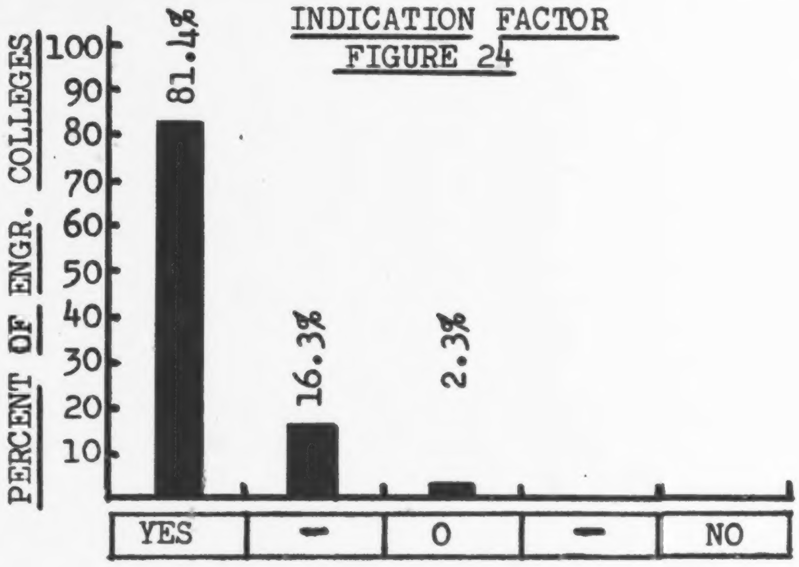
QUESTION NO. 5



INDICATION FACTOR
FIGURE NO. 23



INDICATION FACTOR
FIGURE 24



INDICATION FACTOR
FIGURE 25

E. EDITORIAL COMMENTS

Up to this point we have been discussing ideologies such as empathy, needs and aspirations, supply and demand, moral justifications, degrees of needs, color superficiality, numbers of blacks in engineering, graduates of blacks from engineering colleges, etc. Until this point we have been investigating where the problem of racial inequality lies within the colleges of engineering and, to a certain extent, the forces lying behind these inequalities, forces that maintain them and forces that create them. From this point on, the report will focus primarily upon solutions for the apparent racial conflict.

It is highly significant that the responses shown in Figures 23, 24 and 25 are all pointing toward a positive "Yes" to Question No. 5. Apparently this result is showing where the anxiety lies for the deans, and their own inability to cope with the problem without some involvement with the black high schools. For this reason, the report is not only recommending special programs in the colleges themselves, but it is also recommending that a nation-wide supportive program reaching out into the black high schools be organized. Not one without the other, but the two programs complementing each other.

The deans are almost compulsive about their response of affecting the black high schools in some way to improve the input of qualified black students. They are unanimously saying that the root of the problem lies in the lower grades prior to the admission at the college level. But what about the mediator suggested? One of the deans stated that he failed to see why a mediator was needed. A mediator was suggested in the question because of the complex nature of the problem, whereby his function would be to unite the efforts of the engineering colleges. One of the results of this document shows a diverse range of ideals and theories about the black man and engineering. A mediator is needed to unite the efforts of the engineering colleges, into a harmonious and unified whole. The majority of deans are reporting only mediocre results for their special programs for blacks, however, 8% of them report a positive success from their efforts (see Figure 36). From a limited knowledge of these high success programs, I can detect that the program extends into the high schools as well as merely a special program at the college level. In any case, the mediator should pinpoint in detail the common elements of these high success programs and use them as models for a nation-wide application.

I really have no authority to suggest ASEE as the mediator in this question, but what do these letters stand for? They stand for American Society for Engineering Education, all of which could be applied to the black man's situation. The black people are Americans who have been here a very long time, since 1620 to be exact. They have never had, as people, much of an engineering education. With such a high percentage of the engineering schools attempting special programs (47% from Figure 35) and with such a low degree of success

(Figure 36) it stands to reason that here we are truly combining American tradition with engineering education.

There are several colleges throughout our country that have become noted for their involvement with blacks; they are most commonly known as black colleges. There are six of them for the engineering profession while two are accredited by the profession. I am sure that any of these institutions could more than adequately serve as a mediator and a counselor to whom all colleges could turn. Here would lie the greatest insight to the real needs and problems of the black people, and here lies the greatest response to the intellectual study of the social situation.

VII. QUESTION NO. 6--DO YOU FEEL THAT IT IS THE RESPONSIBILITY OF PREDOMINANTLY WHITE ENGINEERING COLLEGES TO PROVIDE SPECIAL PROGRAMS AND FINANCING FOR THE BLACK STUDENT FOR THE BALANCING (RACIALLY) OF ALL ENGINEERING COLLEGES?

(STATEMENTS BY DEANS OF ENGINEERING)

A. POSITIVE RESPONSE

"To whatever extent feasible."

"White colleges should have programs which consider the special problem of blacks and these programs should include engineering."

"Yes--for public institutions."

"No group in history has ever come to greatness by placing the responsibility for their rise on another group. However, the white colleges should assist vigorously in this effort."

"Engineering colleges have a responsibility to provide education for black students in engineering. It would be desirable to balance racially if this were possible. Good engineering schools should help the students who are interested and qualified. I believe that engineering schools should go out of their way to develop programs to help the black student who has the ability and interest but does not have as good a high school background. We have done that here through our upward-bound program, but generally speaking, it has been difficult to interest many of the black students in engineering. Engineering is a rigorous program in all universities. Many students, both black and white, are not willing to put in the work requirement to succeed in engineering education. In providing assistance, there is a limit on the amount of financing that is possible. The university has gone a long way in financing black students in the university; however, it is my belief that after a reasonable period of help, the student should develop to where he can compete scholastically. It is important that we turn out high quality engineers, and it would be a bad thing for the black race to turn out graduates in engineering who were inferior to the white graduates. I think a great deal needs to be done among the black people to acquaint them with the opportunities for them in engineering. I believe the same thing pertains to women in engineering.

Scholarships to study engineering should be available to all races and sexes on as nearly the same basis as possible. I believe at the present time special efforts should be made to help black students who have ability but have not had the opportunity for as good a high school education to take a little longer and develop an education perhaps through special courses and a little lighter load, providing they are willing and interested in applying themselves and taking advantage of the opportunity."

"If the question implies a substandard degree for black students, I would be entirely opposed. If the financing were available, (which is not the case at my college), it would be desirable to offer remedial courses not carrying college credit to prepare the black student to enter the standard programs and to be able to compete favorably with non-black students."

"The big stumbling block, of course, is poor preparation in mathematics. Any remedial programs must focus in this area. Because of this problem, lowered admissions standards are of no help unless combined with a year of tutorial mathematics."

"It is being done in the college but not preferably in engineering."

"We already do this."

B. PRIMARILY SOCIETY'S RESPONSIBILITY

"Society's responsibility. We should do our part."

"It is the responsibility of primary and secondary education to see that non-white students meet admission requirements. Answering Yes to question would in my opinion be discriminating against other ethnic groups."

"I do not see any reason for "balancing" engineering colleges. I do think we have the responsibility for getting black students into all colleges. However, the entire industrial community has the responsibility for financing such efforts. Actually, I think the first efforts must be toward preparing them for engineering colleges.

"I do not believe in the principle of racial balance for the sake of achieving balance. I think that appropriate transition courses should be developed to bring all students to the point where they can enter present day engineering programs. The responsibility of this rests on society, not on any particular group of colleges."

"I favor the proposal, but don't believe engineering colleges can provide all financing (we have federal, state and foundation support). I also think there are more important reasons for such programs than merely to achieve a racial balance in engineering colleges."

"Private schools do not have the resources. However, we are doing a fairly good job."

"Again it is difficult for private institutions with low endowments."

"This is a very difficult question to answer. I seriously doubt if a first-class predominantly white engineering school should channel a large amount of its limited resources into education of poorly prepared black students at the expense of reducing the financial support of well qualified students of all colors. It is a better policy from the educational, sociological and financial standpoints, to provide special programs in community colleges, the junior colleges and predominantly black institutions to prepare black students to continue their education in first-class engineering schools."

"Blacks should be judged on their own merit as are whites. No discrimination in treatment. No special program based on color."

"Yes--but the high schools need to do a better job (education and counseling)."

C. FINANCE BUT NO SPECIAL PROGRAMS

"The responsibility of a unit in a state-supported system of education with respect to financing of special programs is difficult to answer. Certainly there are among our faculty those who feel strongly that it is our responsibility to seek out special financing for encouraging more black students to attend the engineering school. It should be noted, however, that there is a predominantly black university in the state which does have ECPD-accreditated engineering programs and this institution is also state-supported. There are some interesting questions relating to whether or not we or other nearby engineering schools should make an effort to channel off what might be the better students or whether the legislature would feel that it was competing with itself if it financed programs which essentially worked in opposition. Ideally, of course, both schools should have a better mix."

"I feel that perhaps special financing should be provided for black students but that special programs leading to the B.S. in Engineering should be avoided. I fear that any special programs or special dispensations for black students will automatically attach a stigma to their degrees which will have discriminatory implications for years to come."

"Perhaps financing but not special programs."

"Financing--yes."

"We should surely not provide special programs for any one race--except as these may be strictly remedial in nature--and such should be handled separately from the university. The work here needs to be done at the grade and high school level. We find that our Indian program breaks down when we make it too much of a special program for Indians only."

"We do feel that it is the responsibility of predominantly white engineering colleges to provide financing for black students. We do not believe we should establish special programs."

"Partly--financing."

D. SPECIAL PROGRAMS BUT NOT FINANCE

"To provide programs--yes; to finance--no. (government responsibility); to "balance" is not the objective; the objective is to have opportunity available for ALL people without regard to skin color, nationality, origin, wealth, etc..."

E. FOR ALL DISADVANTAGED

"This has two parts, financial aid and special programs. It is necessary for all colleges to provide financial help for all students who are economically disadvantaged. It is not wise to force a racial balance solely for the purpose of balance. There is no simple answer to the question of special programs for students who are unprepared to undertake a normal college curriculum. Many feel that such preparatory work should be offered in high schools or junior colleges. Where such a solution is not possible the engineering college must provide special remedial courses and tutorial help if it admits unprepared students."

"I object to the white-black aspect of the question. It is the responsibility of engineering colleges to provide special programs and financing for able students of whatever race, creed, or sex, black, white, yellow, red; Jew, gentile, moslem..."

"Change blacks to 'disadvantaged' then I would agree."

"I believe the emphasis should be on the socially or financially disadvantaged students (which includes a lot of black students) instead of just putting efforts on the black student only."

"Financial assistance programs and cooperative work-study serve all needy students equally well."

F. QUESTIONED THE TERM "BALANCE"

"Complete balance may not be possible for some time."

(8)

"Balancing assumed to mean economic consideration, not depreciate admission qualifications."

"Balance is not in itself the goal. The goal is freedom for the black person to do and achieve as he chooses."

"Some are doing this now. Don't understand 'balancing' here."

"It is not the responsibility for the white colleges to provide special programs and financing just to provide a racial balance. It is of interest and in the best interests of the white colleges to seek out black engineering students because of the enormous opportunities available to the black engineer. Engineering has always been a favorite and effective route for social upgrading. It still is. What worked for the farm boy via engineering will work for the black ghetto boy--if he applies himself with the same diligence to the task. Opportunity--yes; responsibility--no."

G. GRAPHS & INTERPRETATION (FIGURES 26, 27 & 28)

QUESTION NO. 6--DO YOU FEEL THAT IT IS THE RESPONSIBILITY OF PREDOMINANTLY WHITE ENGINEERING COLLEGES TO PROVIDE SPECIAL PROGRAMS AND FINANCING FOR THE BLACK STUDENT FOR THE BALANCING (RACIALLY) OF ALL ENGINEERING COLLEGES?

1. The top graph (Figure 26) represents a statistical distribution of the responses from 77 ECPD accredited engineering colleges. The next graph down (Figure 27) separates from this group 36 colleges that have attempted special programs for blacks. The last graph down (Figure 28) gives the responses from the remaining 41 colleges that have had no special involvement with the blacks.

2. The results of these curves are truly phenomenal. For the total response of the 77 colleges, the off-balance from the neutral position is only 1.4% favoring the "Yes" position (26.0%+18.2%-29.8%-13.0%, Figure 26). However, the responses from the colleges that have had special programs for blacks shows this off-balance from the neutral position increasing to 52.9% favoring the "Yes" answer (33.4+38.9 -8.3-11.1, Figure 27). The deans from the colleges with no special involvement with blacks answer in the negative. The off-balance for this group from the neutral position is 43.9% answering "No". (46.3+17.1-14.6-4.9, Figure 28).

3. These three curves show a serious schism regarding the fundamental basis of responsibility. The colleges are almost equally opposed both in number and in intensity to their social commitment. These curves indicate that the mediator pulling these two factions together must be strong and influential. Thus, the recommendation of ASEE or ECPD is suggested rather than a black college, but, I cannot serve as a spokesman for either one of these organizations.

QUESTION NO. 6

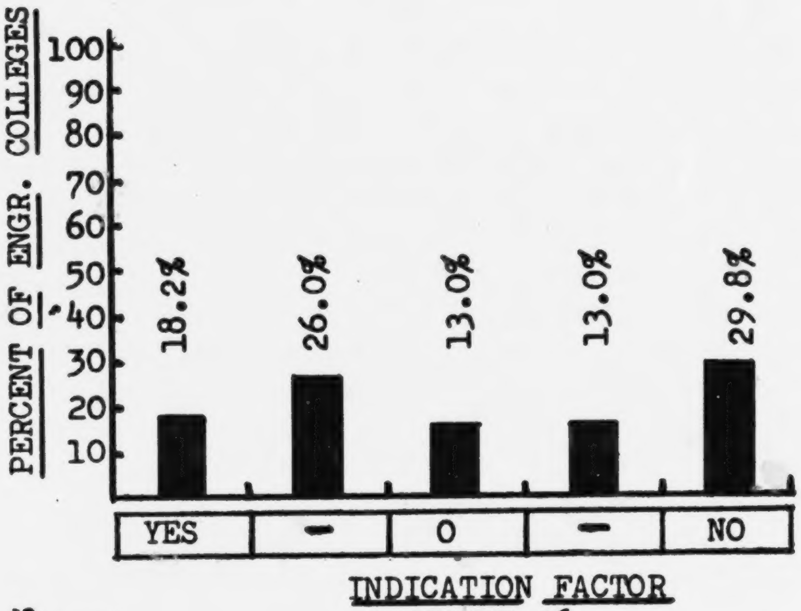


FIGURE 26

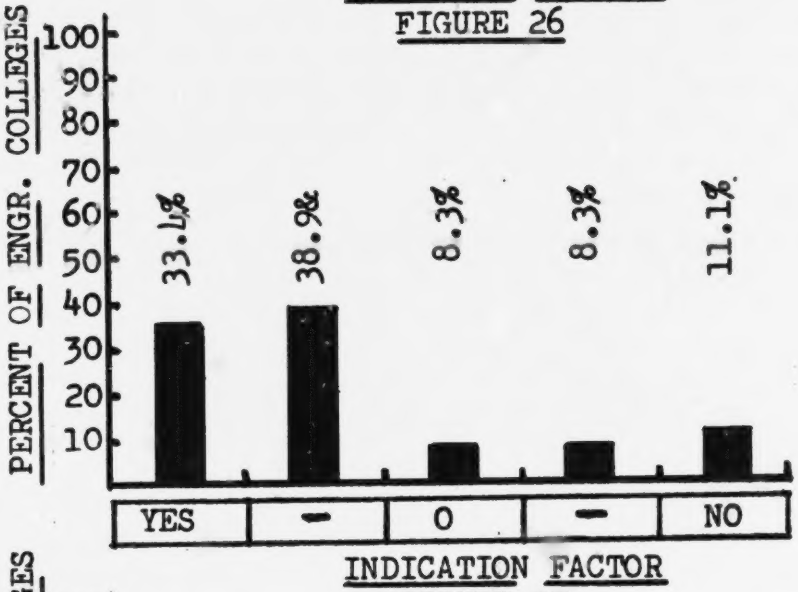


FIGURE 27

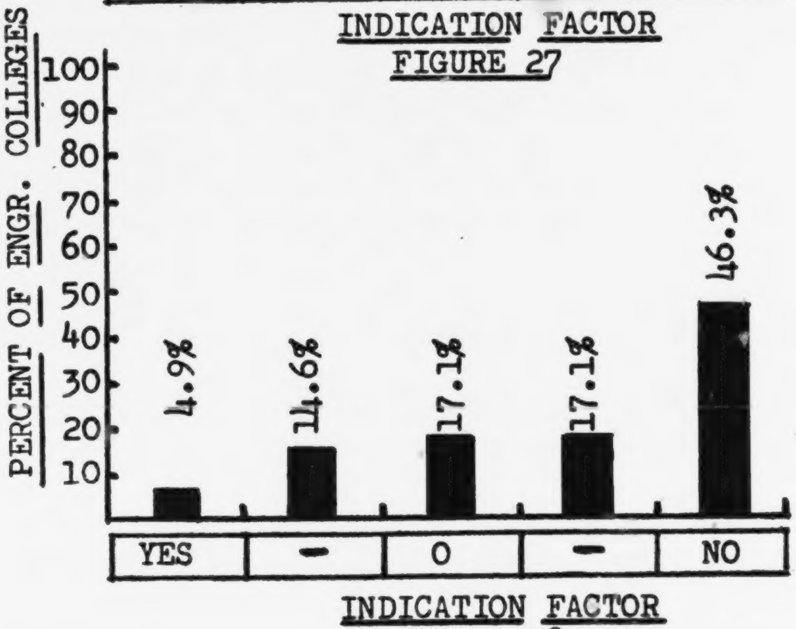


FIGURE 28

H. EDITORIAL COMMENTS

First of all let me reiterate the interpretation of Figures 26, 27 and 28. These graphs indicate that there is a basic and fundamental schism between the engineering colleges that will hinder any massive and positive inclusion of the black student in the near future. It appears that almost 50% of the ECPD accredited engineering colleges accept the responsibility of special programs and financing for the disadvantaged student, while the other half feels that it is the responsibility of society prior to admission into college. The fallacy in the thinking of this latter group is that the engineering colleges themselves are a part of society. If these colleges put the responsibility on the junior colleges, the junior colleges can put the responsibility on the high schools, and the high schools can put the responsibility on the politicians in charge of the school committee, and the politicians can place the responsibility on the taxpayer in their districts, who is the negro, who can't pay their demands for quality education in the first place!!

Let's turn our attention now to another major objection of the deans relating to the term "racial balance". The dean on page 56 writes:

"To 'balance' is not the objective; the objective is to have opportunity available for all people without regard to skin color, nationality, origin, wealth, etc."

This dean is presupposing actualized freedom on the part of the blacks to choose this opportunity if they so desire. But this is a pie-in-the-sky concept of freedom for the black man. True, our constitution of this nation states that all men are equal and freedom applies equally to all, but this is only abstract freedom. The black man is not free to get a good education because the avenues to this type of education are not available to him. We say that blacks are free to choose the opportunity **given by the** engineering colleges to either accept or to reject that opportunity given by the engineering profession, but he is not free to do so. This is abstract freedom that we presuppose he has, but what is the actual freedom, the concrete freedom that he has--that freedom which we see with our very own eyes?

However, the dean on page 57 is coming close to the answer:

"Balance is not in itself the goal. The goal is freedom for the black person to do and achieve as he chooses."

What he is talking about is actualized and concrete freedom for the black man to determine his own destiny. But we are also getting into other areas of discussion such as black empowerment. Perhaps we should begin to ask the question, "Can blacks ever have this type of freedom without the concept of black empowerment?" Not black empowerment leading to violence, but empowerment acting within the limits of freedom, built up by political, economic and participation considerations. All of which leads into constructive race progression for the black man. As has been pointed out previously, assimilation is not the answer but absorption with the development of the unique characteristics of the black race. As this concept relates to engineering, black empowerment would just mean to include the black student in groups, 10.0% would be a good place to start, and allow them to support each other by group participation. Not to force one black student to assimilate into a sea of 100 white students, causing him either to lose or to seriously question his black identity, but allowing groups of black students to enter and allowing them freedom to maintain their black identity within a white majority.

And this same dean is quite correct when he writes, "Balance is not in itself the goal." This concept of balance is analogous to the tithe. The tithe in traditional Judaeo-Christian thought is the giving of 10% of one's income in thanksgiving to God for His acts of creation. Merely to tithe is not the goal, but the resultant of the tithe is the goal.

Likewise, racial balance is not the goal, but the fruit of the racial balance and this, for the black man, is freedom to choose as he wishes. This balance is given in thanksgiving by the engineering college to our nation for its tradition of democracy and freedom for all--actualized freedom for all!!

VII. QUESTION NO. 7--DO YOU FEEL THAT THE PREDOMINANTLY WHITE ENGINEERING COLLEGES SHOULD ACTIVELY RECRUIT BLACK STUDENTS FROM THEIR EXISTING HIGH SCHOOLS?

(STATEMENTS FROM DEANS OF ENGINEERING)

A. ONLY IF THEY ARE QUALIFIED

"You can't recruit what isn't qualified to be admitted. We have had a black recruiter on full-time University employment for one year and yet not one student has been recruited for engineering."

"Engineering colleges should actively recruit black students to the same extent that they recruit white students."

"I believe that white engineering institutions should recruit black students on a somewhat similar basis as the recruitment of white students. In other words, look for people who have the I.Q. and the capability to develop in the engineering profession. People should not be recruited for engineering if they do not have a reasonable chance of doing well in engineering."

"If they are qualified academically."

"Strong efforts should be made to recruit black high school students to enter engineering schools of all kinds."

"And white ones too."

"As an untapped source of engineering talent, active recruitment among the black students population is appropriate, but only as it relates to the identification of that talent."

"Should recruit "engineering students", color should not enter the picture."

"We have been for two years."

B. A REASON FOR

"Active recruitment should be practiced in order to encourage black students to enter the engineering profession."

"In some cases, particularly starting them farther back in Math."

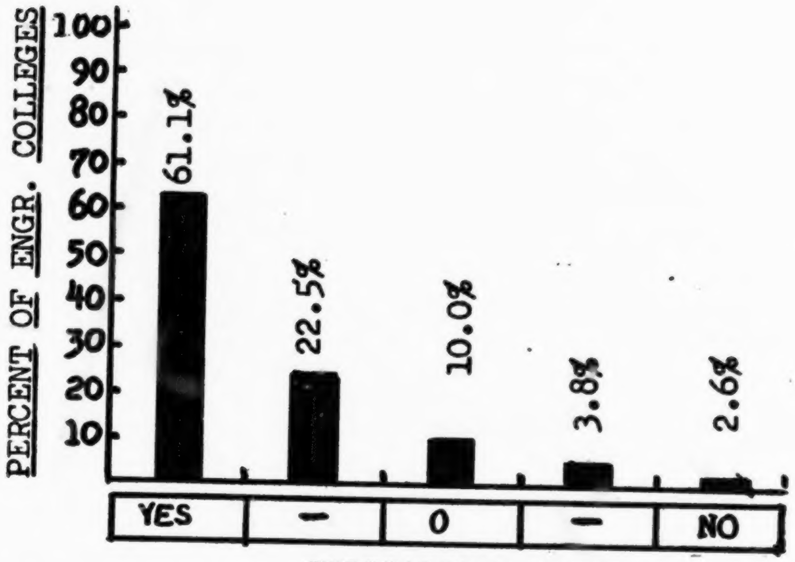
C. GRAPHS & INTERPRETATION (FIGURES 29, 30 & 31)

QUESTION NO. 7--DO YOU FEEL THAT THE PREDOMINANTLY WHITE ENGINEERING COLLEGES SHOULD ACTIVELY RECRUIT BLACK STUDENTS FROM THEIR EXISTING HIGH SCHOOLS?

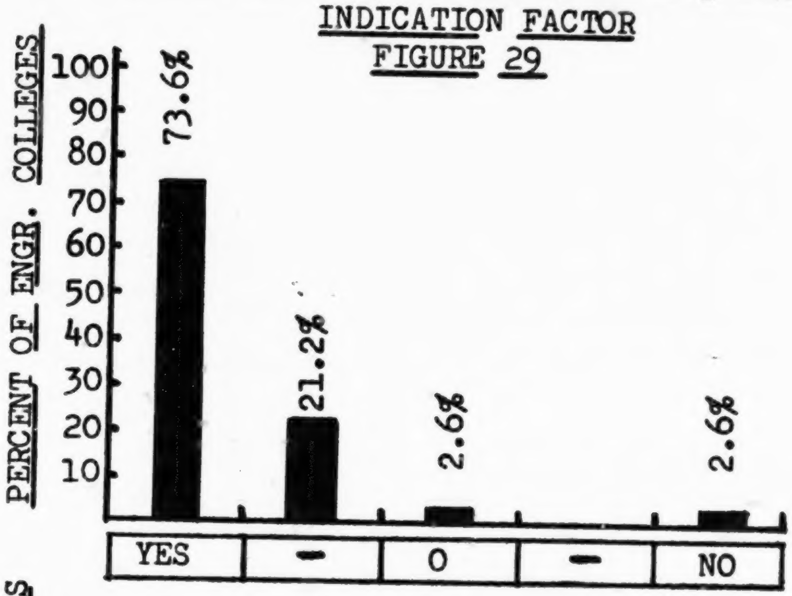
1. The top graph (Figure 29) represents a statistical distribution of responses from 80 ECPD accredited engineering colleges. The next graph down (Figure 30) separates from this group 38 colleges that have attempted special programs for blacks. The last graph down (Figure 31) gives the responses from the remaining 42 colleges that have had no special involvement with the blacks.

2. It is significant to note that all three of these graphs favor a "Yes" answer to this question. The top graph (Figure 29) has an off-balance of 77.2% favoring "Yes", while the colleges with special programs are responding with an off-balance of 92.2% favoring the "Yes" answer. The last graph down, from the colleges with no special programs, are responding with an off-balance of 64.3% favoring the "Yes" answer.

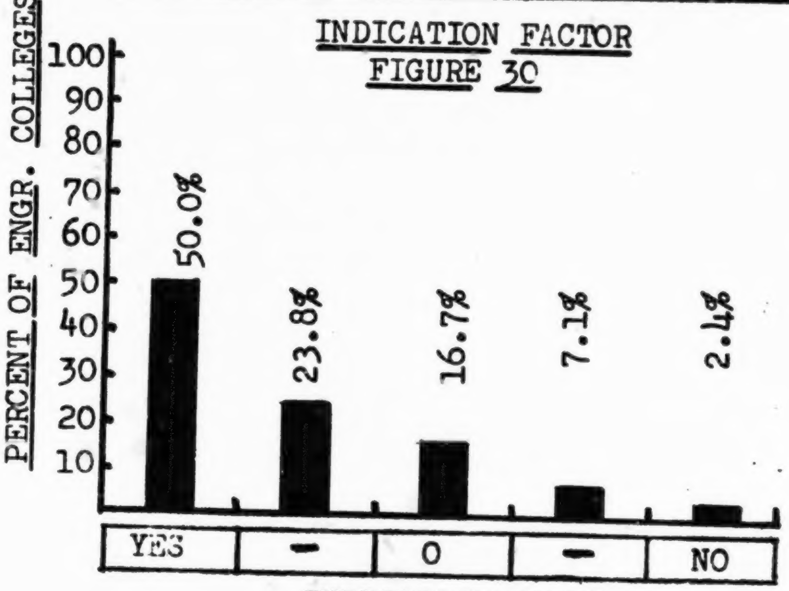
QUESTION NO. 7



INDICATION FACTOR
FIGURE 29



INDICATION FACTOR
FIGURE 30



INDICATION FACTOR
FIGURE 31

D. EDITORIAL COMMENTS

There are several points brought up by the deans in this section that deserve close attention. The first can be seen in the responses from the deans who have had special involvement with black programs (Figure 30). This graph indicates that from their experiences, a feeling is prevalent that something more should be done by the colleges in relation to the black high schools. Thus, I am introducing at this time a recommendation of college participation in the black high schools by the action of faculty exchange. This concept will be expanded upon in Question 9, but it arises from the indication of the deans shown in this graph.

Another point brought up by the deans is the difficulty in attracting black students through the use of traditional recruitment procedures. A dean on page 62 writes:

"We have had a black recruiter on full-time University employment for one year and yet not one student has been recruited for engineering."

This sentiment is shown throughout this document that blacks are not attracted to engineering from the high schools. However, the concept of faculty exchange, whereby one or two black high school instructors would be exchanged for one or two University engineering professors, could help alleviate this problem. From this action, a twofold attraction would be present. First,there would be black representation on the faculty of the engineering colleges which would attract black students.

The second attraction would arise within the black high schools themselves. The students could talk to the engineering professor (who would be teaching mathematics, physics or science) and obtain a first hand account of the benefits gained from entering the profession of engineering. He could stimulate their thinking early in the education process about the profession and could create interest for hard work and diligence in the pursuit of that ambition. All of this is obtained at no extra cost for the engineering colleges.

Likewise, the black instructor in the college could be teaching and counseling with the small minority of blacks already present there and could give them interest in the profession as a black profession as well as a white profession. Perhaps he could alleviate the problem of a doubling drop-out rate for blacks from the freshman to senior years.

Another valuable point is brought up by a dean on page 62 who writes:

"--white engineering institutions should recruit black students on a somewhat similar basis as the recruitment of white students. In other words, look for people who have the I.Q. and the capability to develop in the engineering profession.

The fallacy with this argument is that it assumes equal justice to both whites and blacks with the use of one standard of acceptance, the standard of I.Q. The Intelligence Quotient is based and determined by a white society with the rules of a white power structure. Dr. Arthur R. Jensen of the University of California has convincingly demonstrated that the blacks will lose if this standard is superimposed upon them. He writes:

"In the standard distribution of I.Q. throughout the population, the Negro is 15 points lower than the whites." (Arthur R. Jensen, "How Much Can We Boost I.Q. and Scholastic Achievement?", Harvard Educational Review, vol. 39, Winter 1969, pp. 1-123).

So, if the engineering colleges set the I.Q. standard as their only basis for admission, the negro will never be admitted within their walls. However, with engineering faculty working and teaching in the black high schools, they can know the students throughout, and can make recommendations that are based upon other factors besides the standard I.Q. Test. They can look for motivation, interest, capability, originality, etc. in the student who uses his life stiuation as the context for such judgment.

With the practice of such a transfer system, we are coming close to the insight shown by the dean on page 63.

"Active recruitment should be practiced in order to encourage black students to enter the engineering profession."

This dean is surmising that perhaps the profession of engineering has not done enough to encourage and motivate the black student. Perhaps he is saying that the engineering colleges have been apathetic rather than empathetic toward the black man.

IX. QUESTION NO. 8--DO SPECIAL PROGRAMS FOR BLACKS MEAN LOWERING ADMISSION STANDARDS?

(STATEMENTS FROM DEANS OF DEANS OF ENGINEERING)

A. REMEDIAL STANDARDS, YES----OVERALL STANDARDS, NO

"I cannot answer that question simply. If unprepared black students are to be accepted in regular programs, and not be required to meet the competition--their standards will be lowered; for why should other students meet the competition? If we prepare remedial pre-engineering programs for the black student, which lead to regular programs and regular standards--no reduction in standards need be accepted. We have actively recruited black students for that purpose, but the results are not too good."

"Admissions, Yes; overall standards, No."

"Special programs for blacks may mean lowering admission standards somehwat, but universities should be careful in their selection and make every attempt to develop the black they admit to a level where, by the sophomore or junior years, they will be able to compete with other students reasonably well."

"Special programs for blacks could mean lowering of standards, but need not if these special programs are of a transitional nature to bridge the gap between inadequate high school preparation and basic college admission standards."

"This question is ambiguous. If "special program" is intended to take care of students who cannot meet normal admission standards, then it is obvious that the admission standards must have been lowered in order to admit the students. Special programs of this sort do not necessarily mean lowering of graduation standards."

"Admission standards for the black student in the state college system are already lowered. My feeling is that putting such students into regular classes only grustrates them. If lowered admission standards imply admitting students to the college to take remedial courses in preparation for the standard curriculum, I would be in favor of it."

"Probably we must tolerate lower admission standards, but really we should establish and require special remedial training in special schools. Eventually, we need to go back and overhaul our all-but-useless high school system. This can be done simply by re-establishing a "fail" system in high schools which will serve as the basis for re-orientation training of the misfits."

"Probably for a few years it may be necessary to lower admissions standards and to offer special programs so that black students may be brought into engineering education."

"Remedial programs - yes; into the college itself - no."

"They should not be created unless standards are maintained."

"Special programs for blacks certainly can result in the lowering of both admission standards and standards for graduation. The latter would be especially unfortunate. On the other hand, an institution does not necessarily have to lower standards when special programs are provided, but this requires constant attention and ability to withstand sever criticism which can result if unqualified students are dropped. As indicated under item 6 above, I feel that it is better to provide these special programs in the community colleges, the junior colleges and predominately black institutions."

"The school of engineering at the University of (------) has been involved in the CCEBS program (Campus Committee for the Education of Black Students), and last year eight students were admitted who would not normally meet admission standards for engineering. Of these, 3 are currently remaining in their sophomore year in engineering, 2 of these show promise of continuing after this semester. This year, initially, five were admitted and 3 are still enrolled in the school of engineering. Based upon our experience with these students, we feel that (1) major efforts should be directed toward encouraging high schools to provide a better foundation for the students or (2) a special remedial year be provided between high school and entry to the school of engineering for bringing the students to a level where they can compete with other students. The current program at the University of (------) I do not feel is successful in that not enough "remedial" work is provided to the majority of the students to raise their lev level to the point where they can compete successfully with other students. LOWERING ADMISSIONS STANDARDS DOES NOT SOLVE THE BASIC PROBLEM OF INADEQUATE PREPARATION."

B. TO CHANGE CRITERIA FOR ADMISSION

"Changing criteria but not standards."

"Changing rather than lowering. (SAT's irrelevant)."

"Means introducing new prodedures into admissions process with less reliance on GPA."

"Special programs for blacks mean many things to many people. To some it does mean a lowering of admission standards. To me it seems that any lowering of admission standards must either mean also a lowering of graduation standards or an increased population of frustrated students who are admitted without much chance of success.. However, one possibility which should not be overlooked is that the instruments currently used for measuring admission standards may not give us satisfactory indication of the students' likelihood of success. If this is true, better instruments should be developed and used for all students."

C. NEITHER YES OR NO

"It cannot be answered simply Yes or No. Dr. (---) of our Department of Industrial Relations is currently conducting federally supported study of opportunities for blacks in engineering."

"It depends on what you have in mind."

"Too complicated for simple answer."

"The term "special" implies that color is entering the picture which should not be."

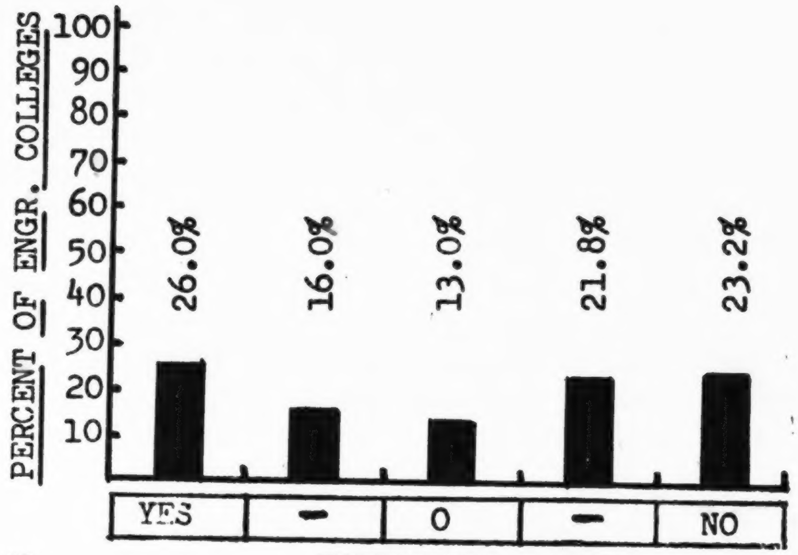
D. GRAPHS & INTERPRETATION (FIGURES 32, 33 & 34)

QUESTION NO. 8--DO SPECIAL PROGRAMS FOR BLACKS MEAN LOWERING ADMISSION STANDARDS?

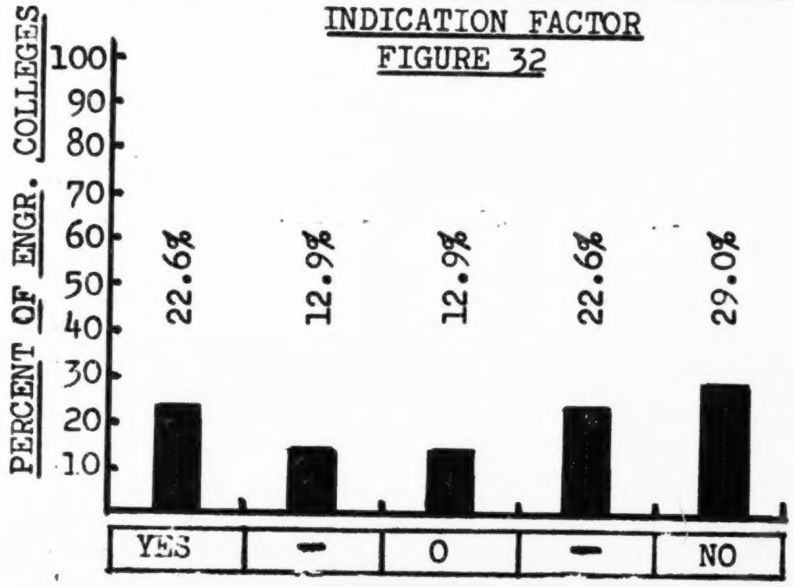
1. The top graph (Figure 32) represents a statistical response distribution from 69 ECPD accredited engineering colleges. The middle graph (Figure 34) gives the responses from the remaining 38 colleges that have had no special involvement with the blacks.

2. The top graph is almost neutral in its response, giving an off-balance of only 3.0% favoring the "NO" answer. However, the colleges that have had special involvement with blacks are answering more positively "NO" with an off-balance of 16.1% favoring this answer. The last graph down is weighted to the other answer of "YES" with an off-balance of 7.9%.

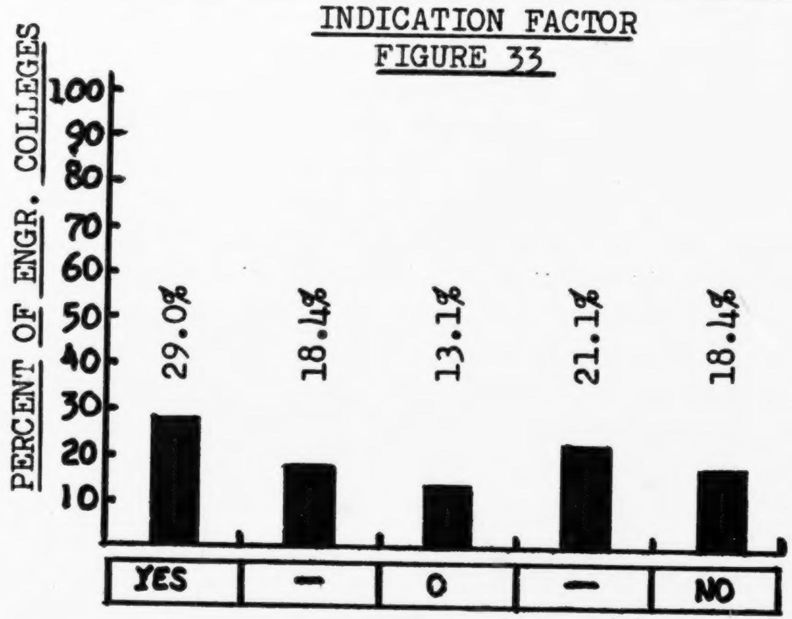
QUESTION NO. 8



INDICATION FACTOR
FIGURE 32



INDICATION FACTOR
FIGURE 33



INDICATION FACTOR
FIGURE 34

E. EDITORIAL COMMENT

First of all, let me clarify my position on the potential of the black man. Even though it is quite possible that at the present time the black race may have an over-all lower average I.Q. as based upon the standards of a white society, I am very optimistic that this handicap could be overcome with the proper education and empowerment of this race within our society. In fact, from my experience, what we have here is a quality race that could surpass any race on this earth if given the chance. But let's not quibble about the foolishness of such competition. The problem at hand is to develop their actualized freedom to match the abstract freedom that our society assumes they have. This fact alone is enough justification for the white engineering colleges to make exceptions for the black man that would not be available to the average middle-class student. It is the tithe of the academic institutions to our nation for its inherent freedom.

And let there be no mistake about my position on the graduate black engineer from the engineering college. I do not desire a second-rate engineer, as the anxiety of the deans indicates they do not want a second-class engineer. On the contrary, one thesis of this document is that the majority of black engineers are coming from non-professional colleges, and the corporations are taking them as fast as they graduate. Yet, they could be better engineers by the standards of our society if the avenues into the ECPD accredited engineering colleges were open and available to them, and if they could be sustained in this professionally recognized college. With the proper conditions available in this latter type of college, the black engineer could graduate with the same standard of quality as his fellow white counterpart, if not higher.

What about the position of the dean on page 70 regarding remedial programs and penalties for the black student of an extra year of training? This is not the answer, for the black student simply will not come. If we have to penalize him an extra year because he is black, he will naturally choose another discipline. So, what is the answer for the time being at the college level until the secondary schools become adequate for the black student? The answer is, again, black empowerment. Accept the black student in relatively large groups and do not expect assimilation from them. Accept them as blacks and allow them to sustain themselves. Go to the corporations and government for support for this group. Allow them freedom, in terms of cultural and racial expressions, to express themselves. We need not be afraid of black empowerment; they are Americans. It will do no harm for the colleges to be confronted with their demands pointing to social injustices. Freedom in expression and group protection is the answer for the time being, not penalties of time.

The second part of this question also gives valuable insight from the deans regarding the admission process. The dean on page 70 writes:

"However, one possibility which should not be overlooked is that the instruments currently used for measuring admission standards may not give us a satisfactory indication of the students' likelihood of success. If this is true, better instruments should be developed and used for all students."

What better instruments could be used than by knowing the student, himself?

It has been discussed earlier that through empathy, the engineering colleges could exchange faculty with the black ghetto high schools. The students would have an opportunity to work with an engineering representative, but also the representative would know the students; he would recommend the students by knowing from experience the qualities that they would need. This exchanged faculty would offer both the channel for the black student to enter the profession, and would also offer the admission instrument for his selection.

But you may ask whether this would be difficult for such a large negro population.

Fortunately, a large percentage of the blacks live in 18 major cities in ghettoes ranging from 1 square mile to 8 square miles. If you divide 180 ECPD accredited engineering colleges by 18 cities, you get 10 faculty members per ghetto, assuming each college exchanges one faculty member. This means that you have a faculty member covering an average of .5 square ghetto mile. This system could provide a powerful instrument in channeling qualified blacks into the engineering profession. But, of course, empathy is assumed throughout, not apathy.

X. QUESTION NO. 9--HAVE YOU EVER ATTEMPTED A SPECIAL PROGRAM FOR THE BLACK STUDENT?

(STATEMENTS FROM DEANS OF ENGINEERING)

A. SPECIFIC PROGRAMS

"Our Engineering Opportunity Program is intended to give educationally and economically disadvantaged students an opportunity to earn an engineering degree. It is designed for students who might not normally go to college, but who in the judgment of counselors, teachers, and other knowledgeable persons, have demonstrated a potential for an engineering career. The program provides educational and financial assistance to make it possible fro a student with limited funds to enter a full-time college program."

"We have a program to bring in black students here in the summer, ahead of the main program, and give them some special training. Also, those blacks that go into engineering have tutoring opportunities that we provide for all students, but our tutors try to spend more time and work harder with the students who have the greatest need for special tutoring."

"(----) School of Engineering has been involved with high schools in Jersey City and (------) Institute for two years to strengthen existing black school programs at the college and high school levels. The major problems are and have been: (1) poor preparation with respect to secondary schools as well as college and (2) organization and financial support of the programs on a scale great enough to have an impact."

"Our projected ideals are expressed in terms of supplementing existing curricula with realistic options for all students with academic weakness in the University. The implementing program is called AIM (Advancement on Individual Merit). There are a number of black students in this program. The College of Engineering curriculum committee is presently working on the program for engineers, and I am in agreement with the idea. This is our first attempt at a special program so I am unable to contribute to your questions on experience. It may be helpful to you to know that Dr. (----) of the (----) College of Engineering is preparing a study which is entitled "Opportunities for Blacks in the Profession of Engineering"."

"And other disadvantaged, too."

"This spring, we instituted a Pilot-Scale program to recruit minority (black and brown) students in engineering. In contacts with two high schools in groups totaling about 20 students, 3 were tutored and enrolled this Fall at (-----) through the educational opportunity for disadvantaged youth. Another 4 voluntarily entered engineering. Professor (----) is in charge of our minority recruitment program. Plans are underway to expand our efforts for 1970-71."

"We have a special financial aid program for minority groups called the Martin Luther King Scholarship Program. The engineering school has over 50 "MLK" students with fair to excellent entrance credentials. In addition, we have some 25 or more MLK students who receive scholarship aid. An Educational Committee of the school assists those having academic difficulties and a counselor (black) advises students on other problems. As the pipeline fills (junior and seniors), we will probably have 100 to 150 undergraduate black students, i.e., 10 to 15 percent."

"As for programs for educationally disadvantaged students, the (-----) College in cooperation with other units of the (----) University of New York and with high schools in New York, participates in several successful programs of the types referred to in the questionnaire. Educationally disadvantaged students are encouraged to continue their education beyond high school and to prepare for careers (including engineering) of interest to them. They are assisted in their efforts by such programs as "Upward Bound" and "College Bound" in the high schools and the "SEEK" and "Hundred Scholar" programs in the college. The SEEK (Search for Education, Elevation and Knowledge) program, established in the (----) University in 1966, permits high school graduates from poverty backgrounds who do not meet entrance requirements to attend colleges as full time students. The program provides for counseling, remedial work, tutoring and financial assistance. Short-term and long-range plans for the (----) College of New York call for even greater emphasis on programs for educationally disadvantaged students in the future. The (----)College, of course, has always provided tuition-free education for residents of New York City without regard to race, creed, or national origin."

"Although I have given a numerical response to this questionnaire, I feel that there are so many interpretations and qualifications that can be put on this question that any numerical mean obtained from all of the returns will be questionnable. There are basically three components: Special programs, financing, and racial balancing. In terms of special programs, I feel that in engineering no special degree program is appropriate at this time. I could see some of the social science and humanities requirements being in the field of black studies. I would think of special programs in terms of helping the student so that he would be prepared to enter a regular engineering curriculum. This would mean helping high school students and providing special summer programs. We are attempting to set up, with government support, such a program next summer. Deprived whites should also be provided with the opportunity. Another approach we are using is to set up 3-2 plans with local black schools. In the latter case, financial support is provided some of the students through an industrial grant. Financing on a broad scale will probably have to be provided by the federal government, since state support as it now exists for present operations is marginal. I do not feel that racial balancing of all engineering colleges is appropriate or feasible. I feel that much more should be done to get blacks into engineering, but I would not aim particularly for a "balance". It could conceivably go either way. It is my feeling that engineering in the past has provided generally for the less affluent white boy to move up the social scale. It may be in the not too distant future that a much greater ratio of blacks than a proportionate percentage will be enrolled in engineering."

"The program proposes to assist students from eighth through twelfth grades. A number of engineers of appropriate background from local engineering organizations have been invited to participate in this new program. Their response has been most helpful. Likewise, a group of engineering students has volunteered to participate. Each of the engineers will team with an engineering student,and both will work with a participating student. They will maintain close contact with the student so as to motivate him to continue his education. The student may merely need encouragement, or he may need assistance with his homework. The team will seek to demonstrate that it is possible for someone from an underdeveloped situation to become a successful engineer and that there are people now at the University who want to help them. During the summer, participating students will be helped to get summer-work opportunities and will be assisted in connection with job activities." (This statement was not made directly by a dean, but was taken from a brochure which he sent.)

"Let me tell you of specific programs which we have underway to solve the problem, which I believe is far more meaningful than statistical tabulation.

a) The University has undertaken a (---) -Pop program for disadvantaged students wherein the students are brought into summer school educational programs following the junior and senior years so as to better prepare them for college. We have spoken to those students about engineering and have interested about 5 of them in the first year's "graduating class" in enrolling in engineering.

b) I have personally written to over 30 black students who came to

my attention as interested in engineering, inviting their possible enrollment at the University of (----------).
c) I have arranged meetings with top administrative officers of all of the (----) Community Colleges in the state to discuss community college transfers and particularly the problems of how we might build up the mathematical and science competency of students transferring from the junior colleges. A substantial portion of this discussion has dealt with the desireability of identifying black students who might be interested in engineering.
d) Similar discussions have been held with the directors of the technical institutes in the state.
e) I have tried to identify black freshmen students and place them under special counseling so as to give them every possible advantage for success.
f) The University has hired a black person as a senior member of its admissions staff and I have worked with him in trying to establish means of identifying black students throughout the state who might be interested and qualified.
g) In our college-day programs with university high schools, we are stressing the need for both black students and for women students in engineering.
h) We have made a special attempt to bring in black graduate students and now have several of these. Arrangements have been made to provide financial assistance to black students in the university.
All of this boils down to the fact that we are sincerely trying to tackle this problem in a number of positive programs. As you well know, one of the serious problems is that black students often don't have the educational background necessary for engineering. Even though they might have the long-range talents necessary for engineering, they instinctively shy away from it, preferring other academic fields where the probabilities of survival are better. We try in every way possible to encourage them to build their educational backgrounds, and I believe that we are succeeding in fair measure, but the problem is a difficult one!" (This letter was from Dean of Engineering to (---------) of (-----) College of Engineering, and this is a copy of the letter.)

B. NOT FEASIBLE

"With government funding available, we would be delighted to encourage as many blacks as possible to study engineering in our school and would certainly be delighted (and able) to carry on whatever remedial or preparatory programs would be needed for the blacks to achieve a high degree of success. In spite of active recruiting, however, almost none of the blacks we attract to the university, choose engineering for their curricular choice."

"In view of the very few blacks enrolled in engineering in this college, the problem of organizing a special program has not arisen. Funds for such a program would be available only by reducing other programs. This we would be willing to do if efforts to recruit black students in sufficient numbers from the high schools proved successful."

"(-------) University is located in a community where there is no large black segment of the population. As a result, the majority of our black students are from the West Indies and Africa. We also have a large number of other foreign students, chiefly Chinese from Hong Kong. A special program in engineering to cater to the varied backgrounds and needs of these students would not be feasible with our small engineering enrollment."

C. ONLY AT THE UNIVERSITY LEVEL

"University has a special program."

"We are in the process of developing a black studies program in the University,but it will be primarily in History, Sociology, Political Science and International Studies, We have some remedial course work available for the less academically able student, but these courses do not carry academic credit."

"The entire college does this."

"University has organized a program and has included engineers, but it was not limited to engineers."

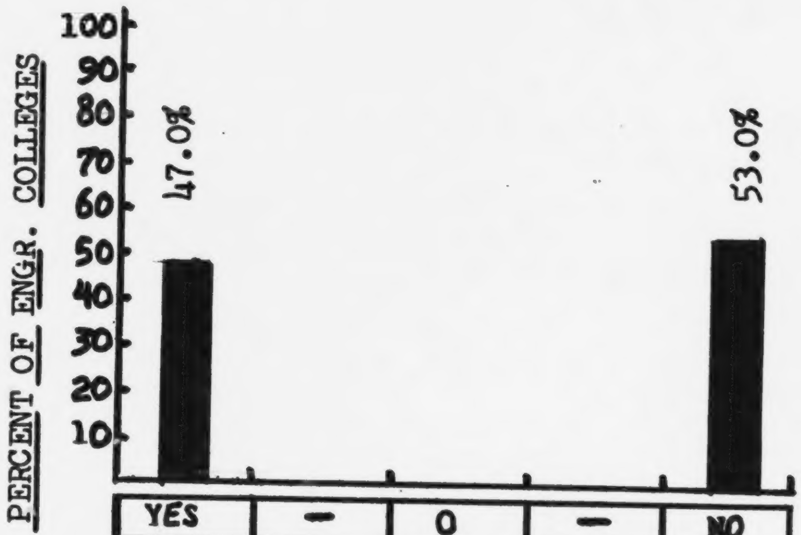
"The university has such a program."

"Not at the college level."

D. GRAPHS & INTERPRETATION (FIGURE 35)

QUESTION NO. 9--HAVE YOU EVER ATTEMPTED A SPECIAL PROGRAM FOR THE BLACK STUDENT?

1. The result of this question has been the basic parameter varied throughout this report. Figure 35 shows that from a random sample of 81 ECPD accredited engineering colleges, 47.0% of them have attempted at one past time a special program for blacks; 53.0% responded that they have never attempted a special program for the black student. By knowing what colleges answered "YES" and also "NO", the data was separated into three separate groups shown in Figures 1 through 42. The first group was the total group, the second was only those who answered "YES" to this question while the third group was those who answered "NO". However, not all of the 81 colleges responded to each of the questions.



INDICATION FACTOR
FIGURE 35

E. EDITORIAL COMMENTS

This section tends to summarize what has been said previously. In the first place, empathy is demonstrated throughout. But what is empathy for the engineering college? Empathy is the emotional feeling and concern for the plight of the black man and his situation. It is only through empathy that a college of engineering will go into a black high school and attempt to strengthen its programs. A dean on page 75 writes:

"(----) School of Engineering has been involved with High Schools in Jersey City and (----) Institute for two years to strengthen existing black school programs at the college and high school level."

Likewise, empathy is demonstrated by this group of engineers working in conjunction with the University serving to interest and motivate the black high school students. This program is shown on page 77.

"The program proposes to assist students from eighth through twelfth grades. A number of engineers of appropriate background from local engineering organizations have been invited to participate in this new program. ---The team will seek to demonstrate that it is possible for someone from an underdeveloped situation to become a successful engineer and that there are people now at the University who want to help them."

This statement not only understands thoroughly the problem involved,but it also understands the need of the corporations. It states that the corporations and the University are working in conjunction on the problem. Not one without the other, but the two in harmony, as the true representatives of the engineering profession. The corporations are desiring to be socially relevant!!

But what about the problems involved? A dean on page 75 writes that one problem is:

"Organization and financial support on a scale great enough to have an impact."

A nation-wide organization does not exist presently whereby the engineering colleges can solidly make an impact. But, even if one did exist, there is still prevalent that basic schism among the engineering colleges relative to their social responsibility!! (Figures 27 and 28)

Also, this concept of balance is brought out by a dean on page 76. He writes:

"As the pipeline fills (juniors and seniors), we will probably have 100 to 150 undergraduate black students, i.e., 10 to 15 percent."

He seems proud of the usage of 10 to 15 percent. But is he proud merely for the sake of the balance?

No, he is proud to say that this college had given the tithe for the nation that will enable abstract freedom for a certain group of people ot become concrete freedom. He is proud to say that his college is concerned with the social issue of the day and is vigorously progressing toward the eventual goal of manifested freedom.

Also, the concept of a changed standard of admission is confirmed by a dean on page 75,who uses the life situation of the student as a basis for judgment. He writes:

"It is designed for students who might not normally go to college, but who in the judgment of counselors, teachers, and knowledgeable persons, have demonstrated a potential for an engineering career."

He is not apathetically sitting back and allowing his filtering admission process to chop away at the root of our constitutional freedom. He considers the life situation of the disadvantaged student through "the judgment of counselors, teachers, and other knowledgeable persons." He is indicating empathy to feel for the student and understand his situation.

All of these comments support the proposal of a nation wide faculty exchange with needy black ghetto high schools within the major cities. This concept provides 1) engineering educational channels not otherwise available, 2) an engineering representative to encourage the students toward the profession, 3) a recruiter who can provide recommendations for the able students, 4) a teacher who can alleviate the problem of inadequate preparation, and 5) a consultant who can encourage the high school to provide a more adequate curriculum.

Let us suppose that we have 200 to 400 engineering faculty working with the blacks and providing pipelines for supply into the colleges. What about the exchanged black teachers working in the white colleges? Granted, they will not have a doctorate degree in engineering, but it is quite probable that they will have a master's degree. They would be quite adequate in teaching fundamental courses in engineering. However, their primary value would be to serve as counselors and to provide motivation for the incoming black students, to know that they are represented on the faculty and in the teaching process. Their presence would serve in the interim until qualified blacks graduate at the doctorate level and can than assume a major teaching function in the engineering colleges.

As was mentioned by a dean on page 75, this concept of faculty exchange is currently being used, but on a very limited and narrow basis. It is primarily directed at the black colleges, with the exchange of faculty at the college level. But there are only six black colleges out of some 269 total engineering colleges. The type of program proposed would be on a scale much too large for only the black colleges to be involved. Also, faculty exchange with the black colleges does not solve the basic problem of motivation and curriculum deficiency of the black student.

XI. QUESTION NO. 10--IF YOU DID, DO YOU REGARD THE RESULT OF YOUR EFFORTS A SUCCESS?

(STATEMENTS BY DEANS OF ENGINEERING)

A. SOMEWHAT SUCCESSFUL

"I do consider our efforts somwhat successful, but not as succesful as we would like to have it in that, of the black students coming into the university, too small a number are interested in engineering. I think that some of the leadership in the black race emphasizes black studies, black history, and a number of things which, while desirable from a cultural and pride point of view, do not provide the black student with some of the fundamental education desirable for upward social mobility based on his own knowledge and capabilities. I think there has been some attitude among black leadership that science and technology, etc., and methods associated with them, do not relate to social problems, and as a result some of the black students overlook opportumities which would open many doors for upward social mobility and achievement. Historically, the engineering profession has drawn more heavily from the lower income middle class of our society who were upward-bound. An example of this is the child from the family of skilled mechanics, who wanted to achieve at a level above that of his parents and chose engineering because it provided that opportunity. I am opposed very strongly to discrimination between race, sex, religion, etc..., but do believe strongly that people given the opportunity should be required to achieve similar qualities in the programs after a reasonable period necessary for a student to overcome previous intellectual handicaps. I do not believe that the black, yellow, red, or female, or any other student should be graduated to the engineering profession with a standard of achievement less than is desirable for the profession."

B. TOO SOON TO JUDGE

"There have been two programs aimed at black students, both efforts to join with predominately black institutions in this same city to develop joint programs. One of these was designed to allow students enrolled at a black university which did not offer engineering to take as much of their work there as possible, but to simultaneously take engineering courses at this institution with the object of working toward two degrees, an engineering degree here and a liberal arts degree at this first institution. The engineering school put in a considerable amount of time and effort on this program during the past three years and the general assessment is that it has not been successful. There have been as many as twelve students enrolled during a given semester and there is the prospect that one or two of those currently enrolled may successfully complete the program. This may be a success of a sort since, if we could graduate two or three students per year, it would about double the number per year. We are still working at this program and still making a considerable investment per student, but we have not yet been in it long enough to graduate anyone."

"Don't know yet - just started."

"It is a beginning."

"Too early."

"Too soon to judge."

"No results up to date."

"Still too new to evaluate."

"Too early to see result."

C. GRAPHS & INTERPRETATION (FIGURE 36)

QUESTION NO. 10--IF YOU DID ATTEMPT A SPECIAL PROGRAM FOR BLACKS, DO YOU REGARD THE RESULT OF YOUR EFFORTS A SUCCESS?

1. The previous graph told us that 47% of 81 ECPD colleges have attempted a special program for blacks. In other words, 38 colleges have attempted some type of program and this graph (Figure 36) is a response curve from these 38 colleges. It is a graph almost neutral in nature with no indication of extreme success or failure. However, it does show that a number of colleges have recently started their program and do not know the results of their efforts at this time.

2. We have already determined by comparing Figure 2 with Figure 3 and Figure 6 with Figure 7 that there is a small difference in distribution between those colleges attempting special programs for blacks, and those who haven't. But lets face it, this difference is not even coming up to par with the mediocre results of the deans reported in Figure 36. The bell distribution curve still is bimodal with one mode occuring at a white/black ratio of 125/1 and ∞ /1 for the senior class. All of this indicates that a nationwide program needs to commence that will increase to a significant amount the number of qualified blacks graduating from the engineering curriculum.

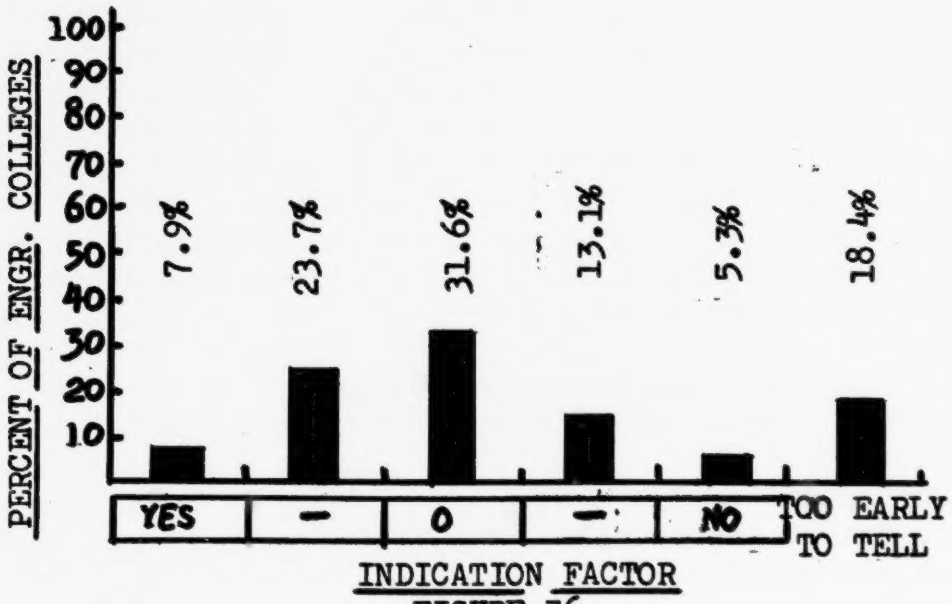


FIGURE 36

D. EDITORIAL COMMENTS

The dean on page 84 brings up several important points that deserve close attention. He first writes:

"I do consider our efforts somewhat successful, but not as successful as we would like to have it in that, of the black students coming into the University, too small a number are interested in engineering."

Here he lays it out on the board. Special programs within the colleges themselves only strike at the superficial and shallow nature of the problem; they do not strike at the basis and reason for the problem. He is talking about motivation and interest on the part of the black student. But it is all a cyclic process. If blacks were on the faculty and if there were large numbers of blacks actively studying in the engineering discipline, the bootstrap cycle would be started. But without black faculty in the engineering colleges and without a large group of black students studying, the cycle will never start. So, how do we start the bootstrap cycle and commence its self-propelling motion?

Again, this same dean comes close to the answer:

"I think that some of the leadership in the black race emphasizes black studies, black history, and a number of things which, while desirable from a cultural and pride point of view, do not provide the black student with some of the fundamental education desirable for upward social mobility based on his own knowledge and capabilities."

This dean is saying that we have a selling job to do. We have a selling task to demonstrate to the black people that respect and pride can be obtained through other channels than what they are accustomed to. But do not knock this idea of culture and pride for the black man. This is his current "soul" and life. He has had enough oppression to fill his stomach, and he certainly won't be attracted to a profession where he would be vulnerable to such possibilities again. We have a selling job to convince them that they have a role in the existing corporations and that black people can successfully be in the engineering profession. But we can only sell this if we truly have respected blacks on the engineering faculties and respected blacks from respected engineering clleges working within the corporations.

But, we don't have this condition presently. The professional colleges are only playing with tokenism and shying from the real problem at hand. Potential respect and dignity must be sold to the black man, and if we don't have it to sell, it must be made!! Here lies the "something special" that could be contributed by the black man for the eventual combining of technology with humanism as first raised in Question No. III. So, in conclusion, the starting of this bootstrap cycle in which blacks can participate in engineering, have leadership in the profession, and have economic power to sustain themselves is my definition for black empowerment. I do not mean black empowerment leading to violence and separation, but black empowerment to give them their deserved concrete and actualized freedom, rather than the present abstract freedom existing for them. I mean black empowerment that gives them the freedom to determine their own destiny rather than to be under the protective umbrella of white tokenism and white paternalism.

But you ask, "How can we give them black empowerment by asking the corporations and the government to support their groups on our University campuses?" The answer is that this support is only the beginning of the bootstrap cycle and of their autonomy in engineering. As the cycle starts and more blacks climb the educational ladder, i.e., to the doctorate in engineering, eventually this support of the black group can be removed. After that support has been removed, the black man will truly have autonomy and will truly have freedom to either accept or reject the engineering profession as he freely wishes.

The same dean again provides valuable insight to the problem at hand. This following statement is characteristic of many deans throughout this report:

"I think there has been some attitude among black leadership that science and technology, etc., and methods associated with them, do not relate to social problems, and as a result some of the blacks overlook opportunities which would open many doors for upward social mobility and achievement."

This statement supports and confirms the idea of faculty transfer with the black high schools. The majority of high school counselors and associated leadership in these schools are of a liberal arts background. Thus, naturally, they would stress this known field of education before stressing the unknown field of engineering and applied science. However, if engineering faculty and practicing engineers were actively present in the black high schools, they themselves could provide the necessary attitude that engineering is socially relevant and exists for blacks as well as whites.

In concluding this section we may ask about the practical implications of what has been said. On the very elementary level, what type of brochures should be sent to the potential black engineering student? The brochure should clearly spell out to the black student the three primary forms of black empowerment that the engineering college is attempting. The first is participation empowerment. Here the brochere can stress the participating element of the black man in the college. A picture of a black man, with a white as well, could be placed on the front cover illustrating that this engineering college is for blacks as well as for whites. Participating elements could also be illustrated within the brochure by showing a picture of the black instructor teaching a class of white and black students. This same black instructor could be shown teaching about an experiment such as using a tension tester or electrical equipment. In other words, the brochure should make it clear to the black potential engineering student that blacks are already participating in the activities of the engineering college.

The second factor that the brochure should bring out is the black empowerment within the engineering college by means of economic power. The entire group of black students could be shown walking into a corporation, a corporation that gives them jobs in the summer and one that contributes to the support of the black group on the engineering campus. It would be more than the traditional co-op program, in that the corporation would be one of many that supports the black group and provides them interim economic power to sustain themselves throughout the engineering program.

The last factor that should be brought out by the brochure is the political power that the black group would have on the engineering campus. Here, a representative of the black group could be seen talking to a student-faculty committee, illustrating that the black group has a voice in the administration of the college. Likewise, a picture of a black student could be shown serving on the student council, illustrating that the black group has a voice among the student body.

In conclusion, the brochure should illustrate black empowerment on the engineering campus. The brochure should illustrate the integrative nature of the empowerment, and it should illustrate the respect and dignity present in the empowerment because here lies the key to the black man's needs and aspirations.

QUESTION NO. 11--HAVE YOU WANTED TO ORGANIZE A SPECIAL PROGRAM FOR THE BLACKS, BUT FUNDS WERE NOT AVAILABLE?

(STATEMENTS BY DEANS OF ENGINEERING)

A. FUNDS WERE AVAILABLE

"Funds were available."

"We have one."

"We wanted to...., and have because funds were available."

"We have now."

B. MISCELLANEOUS COMMENTS

"We plan to work with another university in establishing appropriate transition courses."

"The blacks were not available."

"Programs for rising high school juniors -- requesting support."

"In one sense no -- in another yes."

"Funds are limited but not unavailable."

C. GRAPHS & INTERPRETATION (FIGURES 37, 38 & 39)

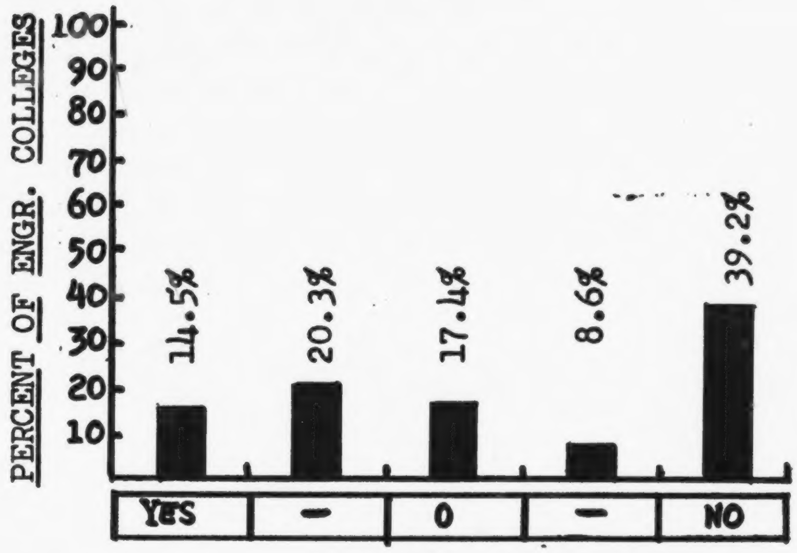
QUESTION NO. 11--HAVE YOU WANTED TO ORGANIZE A SPECIAL PROGRAM FOR BLACKS, BUT FUNDS WERE NOT AVAILABLE?

1. The top graph (Figure 37) is a statistical response from 69 ECPD accredited engineering colleges. The next graph down (Figure 38) separates from this group 26 colleges that have attempted a special program for blacks. The last graph down (Figure 39) represents responses from the remaining 43 colleges that have not attempted a special program for blacks.

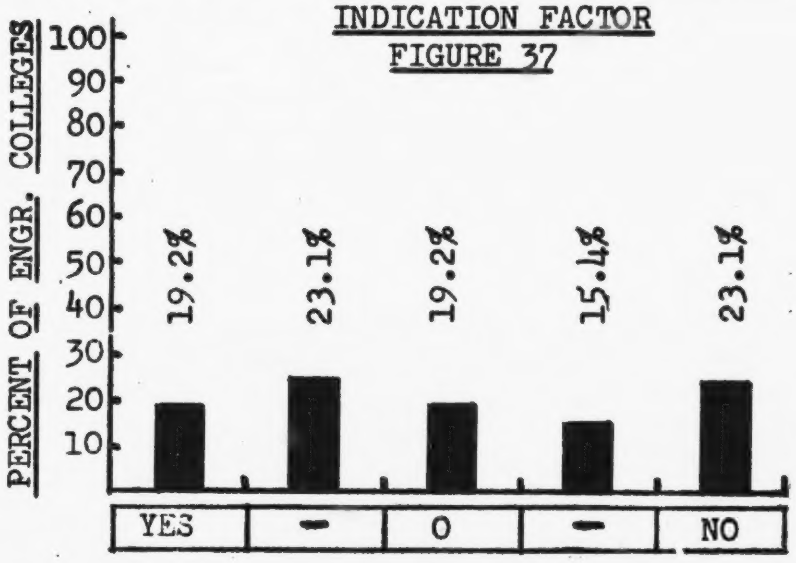
2. The top graph (Figure 37) is slightly weighted to the "NO" answer, the off-balance from the neutral position being 13.0% favoring "NO". The second graph down (Figure 38) favors minutely the opposite answer "YES" with the off-balance from the neutral position being only 3.8%. The last graph down more positively favors the "NO" answer with an off-balance of 23.3% favoring "NO".

3. It is very significant to note that none of the three graphs favors a strong "YES" to this answer. This means that financing of the black students is not a major problem to consider. I think what the deans who have attempted special programs are saying is that funds were available and that they have attempted a special program. However, what about the last graph (Figure 39)? Here I don't think the deans are saying the same thing. I think that this group is saying, "We have not wanted to organize a special program for the blacks, so the funding is irrelevant." The answer could be "NO" if either the college did not want to organize a special program or if it did and funding was not available. This shows to some degree the rigidity of some colleges to even consider special black programs even in the light of special funding and financing available for the black group.

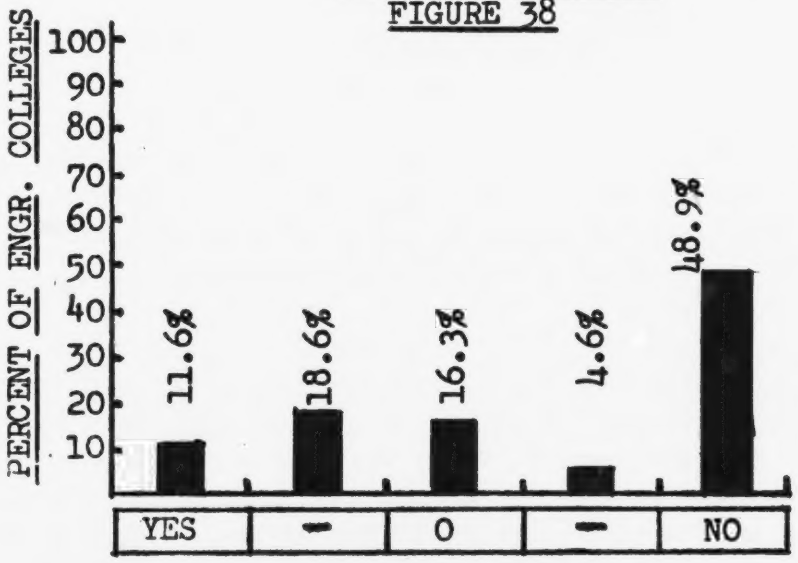
QUESTION NO. 11



INDICATION FACTOR
FIGURE 37



INDICATION FACTOR
FIGURE 38



INDICATION FACTOR
FIGURE 39

D. EDITORIAL COMMENTS

Question No. 11 was designed to ascertain the relevance of funding and financing for the black student. It was asked to determine if financing was a major block among the various engineering colleges that would prevent them from organizing special channels for the black student into their programs. The answer to this question was surprising because this was considered to be a major problem. However, because of the response from the engineering colleges, this opinion has changed considerably.

It is interesting that one dean remarks:

"We plan to work with another university in establishing appropriate transition courses."

His comment is illustrative of the need to combine efforts of the engineering colleges for the inclusion of the black man into the profession. There is much that the white colleges can learn from the black colleges; however, the connections for engineering education on this matter are weak and loosely tied together. There are also duplicate efforts being expended that could be eliminated if a central agency could be formed, tying in all engineering colleges. With the establishment of a central agency, approved programs with the use of a mediator would be a positive beginning. The cost to the engineering colleges could almost be eliminated and, most importantly, the black man could make his entrance successfully into the profession. A combined effort of the engineering colleges would reduce the efforts required from the individual colleges.

All of the concepts introduced by this report hardly costs the engineering colleges anything. The idea of faculty transfer with both the black high schools and the black colleges eliminates first the need for a black recruiter and secondly it eliminates the immediate need to hire black faculty for the sake of having a black motivation stimulus. Likewise, the concept of having a centralized agency dealing only with engineering education and the blacks eliminates waste created by having unsuccessful programs and hiring specialized faculty in each college to organize a unique black program for that college. But most importantly, is the resultant satisfaction to the black engineer, who can have confidence in the black program and know that he is not a guinea pig subject to the idiosyncrasies of that particular college of engineering. The black program would have nationwide fame which would increase the respect and dignity of the black students as seen by their white counterparts. It would be taken for granted by the student body that the black ghetto student would need assistance that they do not require. This fact alone would remove lines of envy or disrespect among the general white student body.

In any case, the result of this question No. 11 clearly shows that financing and funding is not the major problem to consider, as related to black engineering education.

XIII. QUESTION NO. 12--HAVE YOU WANTED TO ORGANIZE A SPECIAL PROGRAM FOR THE BLACKS BUT YOU FEAR A LOWERING OF YOUR ADMISSION STANDARDS?

(STATEMENTS BY DEANS OF ENGINEERING)

A. NO THOUGHT OF LOWERING STANDARDS

"There will be no thought of lowering admission standards."

"We do not figure that a special program for blacks would lower admission standards since such a program, if instituted, would be remedial, prior to placing the students in the regular curriculum."

"We feel that a student, once admitted, should have a good chance of completing his course."

"The problem is rather "inadequate number of qualified and interested (in engineering) blacks"."

B. GRAPHS & INTERPRETATION (FIGURES 40, 41 & 42)

QUESTION NO. 12—HAVE YOU WANTED TO ORGANIZE A SPECIAL PROGRAM FOR THE BLACKS BUT YOU FEAR A LOWERING OF YOUR ADMISSION STANDARDS?

1. The top graph (Figure 40) is a statistical response from 67 ECPD accredited engineering colleges. The next graph down (Figure 41) separates from this group 25 colleges that have attempted a special program for the blacks. The last graph (Figure 42) represents the response from the remaining 42 colleges that have had no special involvement with the blacks.

2. It is significant to note that all three of these graphs answer with a solid and positive "NO" to this answer. This question was originally intended for those colleges who have not attempted any special programs, and their response is shown in Figure 42. Not one dean answered in favor of a "YES" answer. However, they were more neutral (16.7%) on the question than those answering in Figure 41 (4.0%). The response shown in Figure 42 simply tells us that admission standards of the engineering colleges will not be lowered for the sake of black programs. But the question appears to be answered as if the "admission standards" were really "graduation standards". The deans are much more concerned about the latter rather than the former.

QUESTION NO. 12

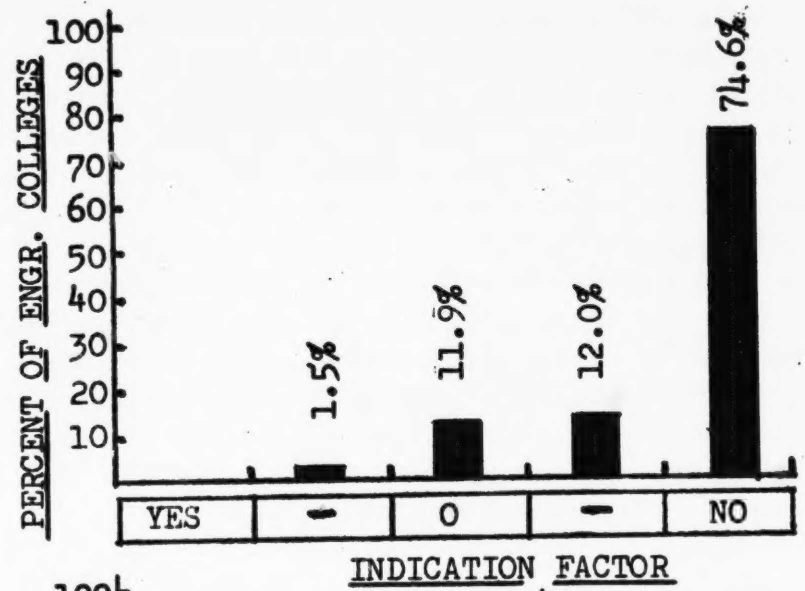


FIGURE 40

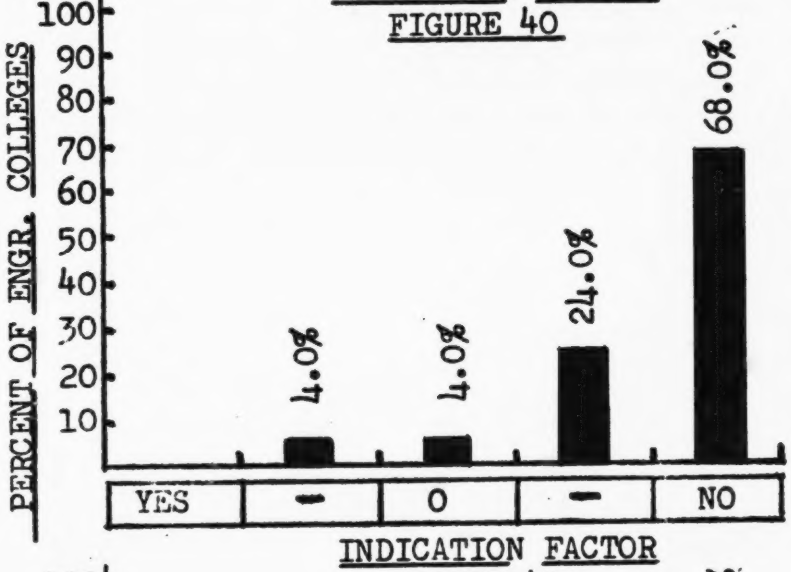


FIGURE 41

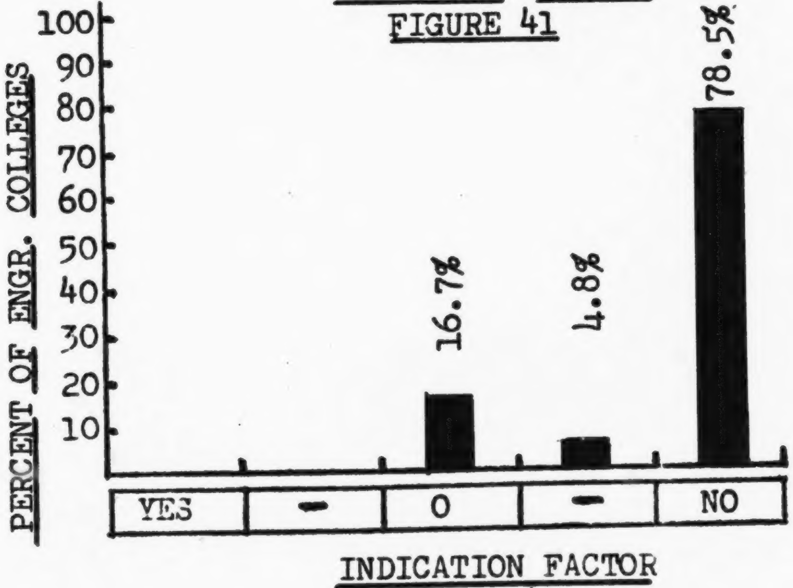


FIGURE 42

C. EDITORIAL COMMENTS

The point that this question raises is the relevance of "admission standards" to "graduation standards". The deans are saying that admission standards will not be lowered, but are they saying that these standards cannot be changed? If a potential black engineer was deemed worthy to enter the profession by competent professors of engineering who had been working with him for four years of high school, and counselors who had been counseling with him, would not this method of determining admission standards (or "graduating standards") be just as acceptable to the engineering colleges? Does not the need as well as the capability have a role to play in our educational processes? Do the admission standards always have to be a cold and hard testing on paper? Or, what about cold and hard paper testing designed by black colleges with questions geared to the experiences of the ghetto black?

No, the answer is not to put supreme faith and trust in filtering processes that are filtering out a whole race of needy people in our society. These filtering processes were built for the good of society and not for their own sake. The key to the problem is to change the filtering process rather than lowering it.